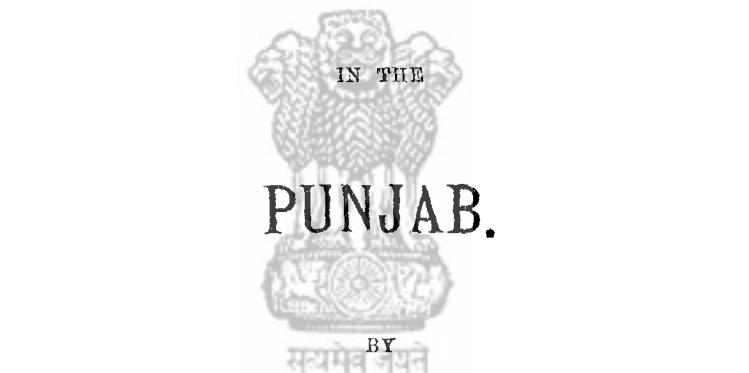


FINAL REPORT
ON THE
REVISION OF SETTLEMENT
(1884—1889).

OF THE
NORTHERN PART OF THE FEROZEPORE DISTRICT



E. B. FRANCIS, Esq.,
SETTLEMENT OFFICER.



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1094
No. —————, dated Simla, 11th May 1893.
144

From— Sir E. C. BUCK, K.C., C. S. I., Secretary to the Government of India, Rev. and Agri. Dept.,
To—The Revenue Secretary to Government, Punjab.

I AM directed to acknowledge the receipt of your letter No. 93,* dated
*Proceedings, April 1893, Nos. 11-18 A., 6th April 1893, forwarding for confirmation the
File No. 21. orders of the Lieutenant-Governor on the final
settlement report of the northern part of the Ferozepore District.

2. The revenue-rates, which have been fixed, are not based on any clearly explained data; and although Mr. Francis, the Settlement Officer, deserves the credit which has been accorded to him for the efficiency and promptitude with which he has conducted the survey operations, it would have been more satisfactory if the relation of the rates to the value of the produce and to cash rents actually paid had been more clearly shown in the final report.

3. The assessments have, under the instructions of Sir James Lyall, been given out for a period of 30 years; and Sir Dennis Fitzpatrick, though he agrees with the late Colonel Wace in thinking that probably a twenty years' term would have been better, is unwilling, in view of the largeness of the enhancement and the improbability of any great extension of cultivation or rise in prices, to shorten the period already fixed. I am, however, to point out that the largeness of the enhancement is itself mainly due to the length of the last period of settlement; and even allowing that there is not now the same opportunity as before for extension of cultivation, yet it is questionable whether any assumption as to the future relation between the rupee and agricultural produce can be made with safety.

4. In any case, even if the enhancement taken at the next settlement to meet the extension of cultivation or rise of prices be in itself small, yet in consequence of the lowness of the present rates a considerable increase of assessment will be necessary in order that the revenue may represent the proper share of the assets to which the State, as representing the general tax-payer, has a claim. The risk of enhancing the difficulty of taking this increase should be diminished as much as possible by curtailing the term of settlement, and the Government of India desire that the present assessments should run for a period of 25 years only, and should expire in 1912-13 instead of in 1917-18 as proposed by the Lieutenant-Governor.

Endorsement by the Punjab Government.

No. 126, dated 21st June 1893.

COPY forwarded to the Senior Secretary to the Financial Commissioners, Punjab, for information and communication to Mr. Francis, in continuation of this office letter No. 92, dated the 6th April 1893, with the request that the Financial Commissioner will issue instructions as to the necessary revised announcements for the shorter period of 25 years now ordered by the Government of India.

No. 92.

FROM

R. G. THOMSON, ESQUIRE,

Revenue Secretary to Government,

Punjab and its Dependencies,

TO

THE SENIOR SECRETARY TO FINANCIAL
COMMISSIONER, PUNJAB.

Dated Lahore, 6th April 1893.

Revenue and Agriculture.

Revenue.

SIR,

I AM directed to acknowledge the receipt of your letter No. 438 of 21st July 1891, with which were forwarded the Final Report by Mr. E. B. Francis of his revision of Settlement of the northern part of the Ferozepore District and also Reviews of it by the Commissioner of the Jullundur Division and by the Financial Commissioner.

2. The Settlement now revised was made by Mr. E. L. Brandreth in 1852-55. During its continuance the cultivated area increased by about 260,000 acres, and population by about 230,000 souls. There was also a large increase in cattle, and a considerable increase in irrigation, largely due to the inundation canals constructed in the lowland of Zira and Ferozepore by the efforts of the people themselves organized and directed by Captain Grey, the Deputy Commissioner.

3. The revised Settlement has been made by Mr. E. B. Francis. His method of assessment was essentially that by separate village units rather than by assessment circles. Very large circles were formed, average rates for cultivation in each circle were deduced, but in substance the new assessment imposed on each village was settled independently for that village in view of its individual circumstances and capacity. The area under settlement was comparatively small and the agricultural system very simple. The Settlement Officer's inspections could thus be more than usually minute. At the same time the increased assessment to be imposed was very large, and required to be apportioned with care and judgment. Under these conditions the method used by Mr. Francis was considered at the time by the Financial Commissioner as the best and simplest that could be adopted; and this view was endorsed by Sir James Lyall, by whom all these assessments were considered and approved.

4. In Moga the new unirrigated rates vary from 11 to 19 annas per acre, in the Lower Rohi from 7 to 13 annas, and in the Bet from 7 to 17 annas. In the detached Maháráj Circle the rate is 9½ annas. The irrigation from wells was assessed by a lump rate per well. Including the estimated canal-advantage revenue, the new assessment amounts to Rs. 7,59,501, which is in close accordance with the orders of Sir James Lyall. The increase over the old assessment is Rs. 2,78,411, or nearly 58 per cent.—a sum which is sufficient to reimburse the whole expenditure on the Settlement in little more than a year. The original forecast of the Settlement indicated a probable increase of Rs. 1,30,000 only, or 27 per cent.

5. The new jamas, with only a single exception, were everywhere received with satisfaction. I am to point out in connexion with this matter that in paragraph 14 of the Financial Commissioner's Review "one-fourth" has apparently been misprinted for "one-tenth" as the fraction which represents the share of gross produce taken as Government revenue in Moga.

6. The irrigation from the inundation canals has been assessed by crop rates on the areas actually irrigated in addition to any fixed assessment already borne by the land. In passing orders on the Zira Assessment Report Sir James Lyall reserved judgment on the question whether assignees of land revenue had a right to receive this canal-advantage rate in addition to the ordinary fixed land revenue. Orders were subsequently issued upon this point in this office letter No. 195 of 18th November 1891, which deals with the assessment of Mamdot. It was then decided by Sir James Lyall that on the Ferozepore system of inundation canals, when the land revenue of any particular lands has been assigned, the assignment includes the fluctuating canal-advantage revenue as well as the ordinary fixed land revenue. These orders apply to the district generally, but only to existing assignments. If any new assignments of revenue be made hereafter in these inundation canal lands the canal-advantage fluctuating part of the revenue is to be expressly reserved. As pointed out by the Financial Commissioner, these orders involve an amendment of the 13th Rule in the Vth Appendix of the Settlement Report.

7. The Rules for the assessment of lands subject to river floods were sanctioned temporarily by Sir James Lyall subject to the results of a further report on their practical working to be submitted by Mr. Francis. This report has since been received with your letter No. 226 of 21st March 1892. For the reasons there given by Mr. Francis, the Rules are now sanctioned subject to the modifications which he recommends as to the classification of *Mash* and as to procedure. It must, however, be understood that the Rules will be liable to amendment at any time if experience should show amendment to be desirable. The related subject of the treatment of lands irrigated by mixed canal and river spill has been finally disposed of by Sir James Lyall in this office letter No. 24 of 4th February 1892.

8. Subject to the confirmation of the Government of India, the Lieutenant-Governor is now pleased to sanction the new assessments for a period of thirty years from the date of introduction. The assessments were under instructions from Sir James Lyall given out for thirty years, and the reasons which actuated him in fixing upon this period will be apparent from the passage of his orders quoted below.* Sir Dennis Fitzpatrick is not prepared to shorten this period, which has been current for more than five years in one tahsil and for four years in the others. It would probably have been better, seeing that the new assessment is, notwithstanding the large enhancement it involves, far below the usual standard, if a twenty-year period had been fixed. But a very heavy increase has been taken, and the people are therefore fairly entitled to a long period of rest. Moreover, the extension of cultivation was so rapid during Mr. Brandreth's Settlement that there will not be much room in future for further extension and increased income from this source. Prices, which have risen so steadily and so largely during the past thirty years, are not likely to rise much further. In some contingencies they might even decline. On the whole any marked increase in the resources of this tract will probably depend on the larger introduction of superior staples on the

* "7. The Financial Commissioner, differing with the Settlement Officer, recommends that the assessments should run for a period of 20 years, for the reasons that difficulty has been experienced in assessing an adequate demand, and that great changes will be introduced by the irrigation from the Sirhind Canal. Mr. Lyall, I am to say, considers that a 30 years' settlement should be granted instead of a 20 years' term. The old Settlement was for 30 years, and to make the new one for 20 years only might create an unfavourable impression; and, seeing that Government is now taking such a large increase, His Honor thinks the zamindars have a right to expect the same term as before. The question is not in Mr. Lyall's opinion affected by any considerations connected with the Sirhind Canal. If it be found expedient to impose within the 30 years' term of settlement any additional assessment on account of the increased rental value of land due to canal irrigation, the impost will no doubt be levied as canal owner's rate, under the authority of the Canal Act, and in the shape of a fluctuating rate on irrigation. In order to do this it will not be necessary to await the expiry of the Settlement." [Punjab Government letter No. 299 S., dated 30th September 1887.]

lands irrigated from the Sirhind Canal, and on the adoption there of a more careful and laborious system of husbandry. For the Government interest in these changes, however, sufficient protection exists in the high graduated canal water rates and in the power to impose an owner's rate in addition whenever it may seem necessary. This power to impose an owner's rate at any time must be distinctly understood as one of the conditions upon which the assessment is sanctioned.

9. The thanks of Government are due to Mr. Francis for the ability, judgment and industry with which he conducted the operations of this Settlement. As remarked by the Financial Commissioner, the methods of procedure adopted by Mr. Francis are not suitable for imitation elsewhere, but it seems to be agreed on all hands that the work was well done. Again, as observed by the Financial Commissioner, the Final Report might perhaps with advantage have contained a little more detail as to the reasons for the assessments adopted. But these are fully stated in the various Assessment Reports, and in other respects the Final Report is a clear and succinct statement of the results of the whole work. Death has unfortunately prevented the acknowledgments of Government being paid to Munshi Nathu Rám, Extra Assistant Settlement Officer, who ably supported Mr. Francis throughout the whole work.

I have, &c.,

R. G. THOMSON,

Revenue Secretary to Government, Punjab.



No. 438.

FROM

J. M. DOUIE, ESQUIRE, C.S.,
Senior Secy. to Financial Commr., Punjab,

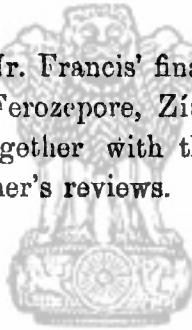
TO

R. G. THOMSON, ESQUIRE, C.S.,
Revenue Secretary to Government, Punjab.

Dated LAHORE, the 21st July 1891.

SIR,

I am directed to submit Mr. Francis' final report on the revised settlement of tahsils Ferozepore, Zira, and Moga of the Ferozepore District, together with the Commissioner's and Financial Commissioner's reviews.



I have, &c.,

J. M. DOUIE,

Senior Secy. to Finl. Commr., Punjab.

Financial Commissioner's Review of the Revised Settlement Report of the Northern part of the Ferozepore District.

The Ferozepore district consists of two parts, which are almost severed the one from the other by the territory of the Introductory. Rája of Farídkot. The northern and smaller portion em-

braces the three tahsils of Moga, Zíra, and Ferozepore, and the southern the remaining two tahsils, Muktsar and Fázilka. The neck of British territory joining together the two divisions of the district is a part of the Mamdot jágír included in the Ferozepore tahsíl. The settlement, of which Mr. Francis' report furnishes a brief but clear and interesting account, was confined to the three northern tahsils, exclusive of the tract in Ferozepore belonging to Mamdot. Fázilka was added to Ferozepore, when the Sirsa district was broken up in 1884. It had been assessed a few years previously by Mr. Wilson for a period of 20 years. The regular settlement of the rest of the district (except Mamdot) was effected by Mr. E. L. Brandreth in 1852—55. The greater part of the territory included in his settlement had been annexed in 1846 after the 1st Sikh War. The assessment was sanctioned for a term of 30 years to expire in 1883, but it was provided that in Muktsar the demand might be revised after ten years. Advantage was taken of this provision to put Muktsar again under settlement in 1868, and a first regular settlement of Mamdot, which had been added to the district in 1856, when the Nawáb was deprived of his powers as an independent chief and reduced to the status of a jágírdár, was made at the same time. The assessments, which were the work of Mr. Purser, were confirmed for a period of 20 years, which has now nearly elapsed. On the completion of his work in the three tahsils above mentioned, Mr. Francis took up the task of revising the settlement of Muktsar and Mamdot.

2. The present report is the first which has been prepared on the new model prescribed in Revenue Circular No. 62. The Form of report. descriptive and historical matter, which has hitherto filled a large part of such reports in the Punjab, has now been relegated to the district gazetteer; and, to quote the words of the circular, a settlement report will in future be "what its name implies, a report of the settlement operations and of matters connected therewith." In these circumstances the Financial Commissioner will confine his remarks mainly to matters bearing directly on the framing of the record of rights and the revision of the assessment. But in dealing with the assessment Mr. Francis has confined himself to a mere statement of the *results* of his work to a degree not contemplated in the circular; and in treating of this part of the subject the Financial Commissioner has found it necessary to supplement to some extent the information which the report contains from the assessment reports of the different tahsils and the orders passed thereon.

3. The physical features of the country included in Mr. Francis' charge General description of are extremely simple, and similar agricultural conditions tract. prevail over large areas. The tract is divided into three plateaux, rising one above the other and separated by two shelving banks, locally known as dandas, which run more or less parallel to each other and to the present course of the Sutlej. The most southerly of these banks, the line of which corresponds roughly with the boundary between Moga and the other two tahsils, is 15 or 16 feet high, and marks the edge of the old valley of the Sutlej, when that river ran much further south than it does at present. Above this bank is the country locally known as the Rohi, which includes nearly the whole of the Moga tahsil and a few estates in Zíra and Ferozepore. The lesser danda, which separates the former and present valleys of the Sutlej, has an elevation of only four or five feet. The tract between the two banks is called by Mr. Francis the Lower Rohi, to distinguish it from the uplands of Moga or the Upper Rohi. It corresponds pretty closely with his Zíra and Ferozepore Rohi assessment circles. The third and lowest plateau consists of the Bet or the existing valley of the Sutlej, which is 12 miles wide to the east of Zíra, but becomes much narrower to the west of that town.

4. Mr. Francis' charge contained 782 estates covering an area of 1,684 square miles, of which 1,469 were under cultivation. The ^{The Jangal and Upper Rohi tracts.} Moga tahsil with 209 villages occupies almost exactly half of the whole area. It includes an outlying tract with an area of 184 square miles surrounded by Patiála, Jínd, and Farídkot territory, and known as the Mahráj iláka. This is a portion of the "Jangal Des," to which a great part of Patiála and the Jangal circles of Ludhiána and Hissár belong. The soil is usually very sandy, and has often been blown up into sandhills, which are a marked feature of the whole Jangal country. Wonderfully good crops are produced with a small rainfall, which in this part of Ferozepore averages only 16 or 17 inches in the year and complete failure is of rare occurrence. Mahráj formed a separate assessment circle, but in the present report Mr. Francis has not kept it apart from the rest of Moga, but has treated the whole tahsil as included in the Upper Rohi tract. The differences between Mahráj and the main part of the tahsil are however considerable, both as regards soil and the character of the inhabitants, and the Financial Commissioner thinks it would have been better to discuss separately the assessment of the Jangal country or Mahráj and the Upper Rohi proper which forms the rest of the tahsil. The distinguishing feature of the latter is its smooth and firm brown loam soil with a sufficient, but not excessive, admixture of sand. It is excellently adapted to the local rainfall, which only averages some 20 or 22 inches yearly, possesses remarkable powers of resisting drought, and the yield of the crops is much heavier than in Mahráj. The water level in Mahráj exceeds 100 feet, and wells cannot be used as aids to cultivation. There is a small amount of irrigation on the northern and eastern edges of Moga; but less than 2 per cent. of the whole cultivated area was recorded as cháhi at settlement. The Abohar Branch of the Sirhind Canal runs through the heart of Moga, and in 1885-86, two years before the new assessments were introduced, it watered over 29,000 acres or 8 per cent. of the total cultivation. The Bhatiána Branch passes through Mahráj, but irrigation from it had not been started when Mr. Francis made his assessment. The crops of the two tracts are very similar, wheat or barley mixed with gram and rape being grown in the spring harvest, and jowár or bajra mixed with moth in the kharíf. In both, but especially in Mahráj, the rabi is the principal harvest. Almost the whole tahsil is owned by Sikh Jats. The Mahráj men are opium eaters and are much less industrious and thrifty than their caste fellows in Moga, who are shrewd and frugal, good both at agriculture and trade, very independent of the village bania, and whose worst fault is probably their proneness to litigation. Money-lenders have obtained little hold on the land either by sale or mortgage.

5. The Lower Rohi, which occupies nearly one half of Zíra and of the ^{The Lower Rohi.} part of Ferozepore settled by Mr. Francis, is inferior in natural advantages to the tract just described. Its characteristic soil is a reddish or orange-coloured sandy loam, and the crops are less secure and their yield lighter than in Moga. Well irrigation is rarely resorted to. The cháhi area amounts to 4 per cent. of the cultivation, but most of the wells are in those parts of certain estates included in the Rohi circles which lie in the river valley below the danda. Above the bank the water level is only about 40 feet, but the water is often brackish, and the coarse sandy soil is little adapted for irrigation. There is a small amount of irrigation from inundation canals in the Bet lands of Rohi villages. The cropping is very like that in Moga, the chief differences being that the spring harvest is still more important, occupying 78 per cent. of the total area, and that more wheat and less rape are grown. Wheat is always sown mixed with gram, but the tendency now is to increase the proportion which the more valuable grain bears to the whole crop. The Jat landowners are good farmers, but by no means so prosperous as their fellows in Moga; and money-lenders hold much more land on mortgage than in the Upper Rohi. So far, however, the total amount of alienation is not large, and the people having good sized holdings are able to live with a fair amount of comfort.

6. The rest of the Zíra and Ferozepore tahsils consists of the Sutlej ^{The Bet.} Bet which forms in every respect a marked contrast to the uplands. The soil is usually a stiff thirsty clay which

cannot be ploughed at all till it has been thoroughly softened by irrigation or heavy rain. After the crops have been sown and have sprouted, weeds give constant trouble; and, as the soil below the clay consists often of river sand, the crops are very liable to fail when not artificially irrigated. The average rainfall varies from 25 inches in the east to 20 or less in the west of the Bet, while the fluctuations from year to year are considerable. As Mr. Francis has expressed it in the Zira assessment report the peasant of the Bet is "a slave to his well," and the labour of cultivation is far more severe than in the uplands. Twenty-five per cent. of the total cultivated area is protected more or less by wells, 23 per cent. is irrigated from inundation canals, 7 per cent. is flooded by the river, and 45 per cent. is dry. Some account of Colonel Grey's inundation canals will be found in para. 20 of the Zira assessment report and on pages 5 and 6 of the gazetteer, where Mr. Francis has also indicated the sources from which fuller information on the subject can be obtained. The canals were roughly constructed and the irrigation they afford is of a somewhat uncertain character, while swamping has done a good deal of harm in places. The navigation channel of the Sirhind Canal has cut across the tail irrigation of some of the district canals, and measures have had to be undertaken to carry their water across it. Government has recently agreed to contribute for the improvement of these canals Rs. 5,000 annually for three years on condition that the District Committee expends an equal amount from its own resources. The management of the canals is at present good. Any failure in this respect would have very serious consequences, for the agriculture of the Bet has come to depend very largely on their successful working. They enable the people to raise some 8,000 acres of maize and rice and a little cane and cotton. Jowár and chari are often watered from them, and the total kharif irrigation amounts to about 16,000 acres, while some 30,000 acres get a preliminary watering for rabi crops, of which the principal is wheat. The favourite well crops are wheat and maize. Wheat too is largely grown in unirrigated land, but the yield is light and far from secure. It is a significant fact that, notwithstanding the large irrigated area, the crops in years of drought suffered, according to Mr. Francis' returns, much more in the Bet than in the uplands.

The climate is unfavourable both for man and beast. The people are weakly and the cattle short lived, a serious matter where there is so much well irrigation. The landowners are mostly Mussalmán in religion, and Dogars, Rájpúts, Gujars, Jats, and Aráíns by caste. The Dogars are extremely improvident and the worst of cultivators. The Rájpúts and Gujars are somewhat better husbandmen, and the Jats and Aráíns may be classed as good farmers. But the latter are much in debt owing apparently to pressure of population and constant subdivision of property due to family quarrels. Altogether the Bet is a poor and struggling tract, where the peasant has many difficulties to face, with which from ancestral habits and the apathy produced by a bad climate he is ill-fitted to cope.

7. Under Sikh rule the Bet paid a much heavier revenue than the uplands, partly because cultivation had been longer established and partly from the natural inclination of native rulers to favour their own coreligionists. Mr. Brandreth's settlement was begun only six years after annexation, when the district was still in a very undeveloped state. The Chief Commissioner pronounced the assessment to be a moderate one, and it was certainly much lighter than that imposed about the same time in the neighbouring and, in many respects, similar district of Ludhiána. Mr. Brandreth corrected to some extent the inequality between the Bet and the Rohi; but it is clear that he himself over-estimated the resources of the former. The settlement worked well except in the Bet of the Ferozepore tahsil, where considerable reductions had to be given in the first few years of its currency. But the spread of cultivation soon made the revenue very light everywhere, except in a few Bet villages, and it was realized with ease and regularity.

8. The term of Mr. Brandreth's settlement expired in 1883, and early in 1884 Mr. Walker, who had recently finished the Preliminary report on the fiscal prospects of re-assessment. Ludhiána settlement, reported on the necessity and probable financial results of a re-assessment of Ferozepore.

On the first point there could be no doubt, for the increase of cultivation amounted, according to Mr. Walker's figures, to 33 per cent., the agricultural conditions of the Bet had been greatly changed by the excavation of canals, and a very considerable rise of prices had taken place. Mr. Walker calculated that an enhancement of Rs. 1,30,000 might be taken, giving an increase of 27 per cent. on the existing revenue. In the event this forecast was largely exceeded, but at the time Mr. Walker was justified in assuming that the policy of Government would be "to limit the amount of enhancement to a certain percentage on the previous demand, as was done in parts of Ludhiána," and in supposing that a rate of increase higher than 33 per cent. would not be allowed in any tahsíl. The old maps were not drawn accurately to scale, and neither they nor the record of rights had been kept up to date; and it was decided that the new settlement should include a revision of records.

9. The settlement may be said to have begun in November 1884, when Duration and cost of settlement. Mr. Francis took charge of it, although a small party under an Extra Assistant Settlement Officer had been at work in the district for six months previously. The new assessments were introduced in Moga in Kharif 1887, and in the other two tahsíls a year later. The work was finished in the spring of 1889 having lasted four and a half years. The total cost was $3\frac{1}{4}$ lakhs or little more than the increase of revenue accruing in a single year from the operation of Mr. Francis' assessments.

10. The work was much hampered by the ignorance of the patwáris, The patwári staff. and in the end Mr. Francis had to get rid of nearly half of the men whom he found in office. Till the reorganization of the káníngó establishment in 1885 this was the usual experience of Settlement Officers, but much has since been done to improve the position and increase the efficiency of the patwári staff; and it may be hoped that in future this hindrance to the prompt completion of settlement work will in large measure disappear. Though the rate of the patwári cess was lowered from Rs. 5 to Rs. 4-11-0 per cent., the income of the fund has been much increased in consequence of the enhancement of the land revenue, and the opportunity has been taken to raise the pay of the patwáris and provide a small staff of trained assistants. At the same time the expenditure has been kept well within the income, and the patwári fund of the district is now in a thoroughly solvent state.

11. The account given by Mr. Francis of his measurements is of special value because he has made the subject of village surveys Measurements. by patwáris his own. The result of his experience in Ferozepore has been embodied in a useful mensuration manual intended for the use of patwáris and boys attending village schools. But the merits of the square system as providing a framework for a field to field survey, which any properly trained patwári can construct with the greatest accuracy, are now generally acknowledged, and it is needless for the Financial Commissioner to say anything further on the subject. Mr. Francis checked his measurements with a skeleton traverse made by the Survey Department with the most satisfactory results, and his maps are being utilized after reduction for a new topographical survey map of Ferozepore. The Financial Commissioner has ascertained from the Surveyor General that the maps fulfil his requirements except that they do not show certain topographical details, which were not required by the instructions under which Mr. Francis worked, but which Settlement Officers have now been ordered to supply (Revenue Circular 51, para. 3). The Commissioner appears to think that the non-entry of the linear dimensions of the sides of fields in the maps is open to some objection. Mr. Smyth admits that, if the plotting is correct, the entry of the dimensions is superfluous, and the special feature of the square system of measurement is the guarantee it affords for accurate plotting. In his remarks regarding the showing of khatauni numbers in the map, the Commissioner appears to have lost sight of the fact that a revised edition of the shajra is filed with the detailed jamabandi prepared in every fourth year. But Mr. Rivaz sees no particular advantage in showing within each field the number of the holding to which it belongs instead of entering it in an index on the margin of the mapping sheet.

12. It is unnecessary to say much about the framing of the records of rights, for the orders which the late Colonel Wace gave to The new records. Mr. Francis in this matter were practically identical with

those afterwards issued as rules under the Land Revenue Act of 1887. How laborious the work of bringing the papers up to date was may be judged by the fact that 260,000 mutations were attested in the course of the settlement. The records were prepared after the model laid down in Act XVII of 1887, the chief difference between them and settlement records of the older type being the omission of the field register or khasra. The bulk of the records has thus been much reduced, but their usefulness has not, in the Financial Commissioner's opinion, been thereby impaired. The detailed jamabandís, which Mr. Francis has included in his standing record, do not in the case of Zíra and Ferozepore show the new revenue of each holding, as they were prepared for the year before the new assessments in these tahsils came into force. The revenue must have been distributed over the holdings as entered in these jamabandís, and it would have been well if Mr. Francis had shown in red ink the new demand for each holding as well as for the estate and its main subdivisions. The matter is not one of much importance, for under the Land Revenue Act of 1887 the record prepared at settlement has no greater legal force than any subsequent annual record. But orders have recently been issued to Settlement Officers to enter the new revenue by holdings in the jamabandís, which form part of their standing records.

13. The table on page 8 of the report gives a useful summary of the development of tract increase of the resources of the tract between the regular between regular and revised settlements. In 1853 the cultivation was 61 per cent. of the whole area, in 1886 it was 87 per cent.

In the upland villages there is scarcely any culturable land left which has not been ploughed up. The number of wells had increased by 50 per cent. in the Lower Rohi and 100 per cent. in the Bet, and the inundation canals had added 50,000 acres to the irrigated area of the latter. The Sirhind Canal had made it possible to raise much more maize, cotton, and wheat in Moga, but of this no account was taken in the assessment, as the canal water rates had been pitched high enough to be equal to occupier's and owner's rates combined on the two other great perennial canals of the Punjab. The canal has done much to secure the Moga tahsíl against the effects of drought. In 1889-90, when the area of successful báráni crops in the Moga circle was only 239,665 acres or three-fourths of the recorded báráni area, the canal irrigated nearly 70,000 acres of crops. In Mahráj in the same year, when báráni crops ripened only over 57 per cent. of the báráni area, it watered 13,500 acres. Population had expanded still more rapidly than the cultivation, but so far there was no pressure on the soil, and it is satisfactory to find from the returns of the recent census that the increase for the past ten years has only been about 7 per cent. The breaking up of the waste had not prevented an enormous addition to the number of cattle to meet the wants of the enlarged population. The Settlement Officer calculated that prices had risen by 45 per cent., while the opening of the railway lines from Ferozepore to Raiwind and Rewári had provided a guarantee against very violent fluctuations in the future.

14. The only soil distinctions recognized were those based on the presence or absence of canal or well irrigation, or of inundation by the river. On the surface at least Mr. Francis' method of framing his assessment rates differed a good deal from that usually adopted. With the permission of the late Colonel Wace, he omitted to prepare elaborate half assets estimates after the pattern prescribed in the rules under the Land Revenue Act of 1871. But his assessment reports contain produce estimates for the different classes of soil in each tahsíl, except báráni lands in the Ferozepore Bet, where "unirrigated cultivation is in fact hardly to be regarded as an accepted part of the system of agriculture," inundated lands, and the small well-irrigated area in the Rohi circles of Zíra and Ferozepore, in regard to which the Settlement Officer was able to fall back upon his estimate for similar land in Moga or in the Bet circles. Mr. Francis described his estimates as rough, but there is no reason to suppose that they were in any way less valuable, because they were reported in a very simple form. The assumed yields were based on a close and accurate knowledge of the local agriculture, and the value of the landlord's share of the produce was calculated with sufficient care. The weak point in the estimates was the uncertainty as to the proper record of

unsuccessful crops. The rule requiring patwáris to take account of failures was a new one when the assessment was made. Mr. Francis was well aware that it was imperfectly carried out, and did his best to meet the difficulty by adopting moderate estimates of yield. The question whether in this way the balance was really redressed was not one of much practical moment. The revenue rates were in no sense deductions from the half assets rates. A light assessment had been allowed to run on for 33 years, during which the condition of the district had been completely altered, and to follow the half assets standard in fixing the new demand was manifestly impossible. Mr. Francis took rates of increase which had hitherto been very unusual in the Punjab, and the enhancement he secured was twice as large as that which Mr. Walker had anticipated. Yet his deliberate opinion was that in Moga, where he raised the revenue by 61 per cent., his demand did not exceed the value of one-fourth of the produce, or not more than one-half of a standard half assets assessment. The variations between the new assessments and true half assets were certainly wide, but it may be doubted whether they were really as great as such a statement would indicate. It is noteworthy that both in Zíra and Moga the Settlement Officer assumed that the acreage of successful crops bore a higher proportion to the recorded cultivated area than the harvest returns of the years which have elapsed since his statistics were compiled would justify. Thus when he remarked that in Moga "failures of rabi (crops) probably do not average more than 2½ per cent. in a course of years," he had seen the spring harvests of 1885 and 1886, when the areas of successful crops were returned as 295,000 and 329,000 acres. The highest figure for the next four rabi harvests is 287,000 and the lowest 219,000, the average being 258,000.

15. The assessment circles were very large, and, as was pointed out by Method of assessment adopted. Government at the time, some of them might with advantage have been divided into several subordinate circles. Mr. Francis' assessments were really founded on rates already sanctioned by Government for adjoining tracts modified to suit local circumstances as ascertained by an exceedingly careful enquiry on the spot into the resources of each estate. Thus in Moga he began by applying the unirrigated rate of Re. 1-3-0 adopted a few years previously for rausli and dakar in the Upper Dhaiā circle of the Jagráon tahsil of Ludhiána to the estates in the north-east bordering on that pargana, gradually lowering his rates as he proceeded southwards and westwards to meet the known diminution of the rainfall and the falling off in the quality of the soil which he observed, till he got as low as 11 or 12 annas an acre in the estates in the extreme south-west of the circle. His village assessments brought out an average unirrigated rate of 13-8 annas, and this he proposed for adoption as the revenue rate. The same process was followed in the Zíra Rohi, the standard of comparison here being the rates previously approved by Government for Moga. Thus Mr. Francis' rates were based on his village assessments, and not *vice versa*. This has been true in a measure of other settlements, as regards which the fact has not been so frankly avowed, and this at least may be said that no prudent Settlement Officer would propose revenue rates for a circle till he had made a rough assessment of most of the estates included in it. Though unsuitable for general adoption, Mr. Francis' method of framing and reporting his rates was open to little objection in the peculiar circumstances of Ferozepore, where any close approximation to the theoretical standard was impracticable, although very large enhancements were being proposed. Its defect lay in this that the results could not be checked effectively by superior authorities, and had to be accepted mainly because it was clear that the Settlement Officer had a thorough knowledge of the tract in his charge, and because reliance could be placed on the soundness of his judgment.

16. In the 16th paragraph of his report Mr. Francis has stated the báráni and cháhi rates adopted in each tract. A lump ábiána was fixed for each well. How carefully this was done may be judged from the following account of the procedure followed in the Zíra Rohi extracted from the assessment report of that tahsil:—

"Each well was seen during my inspection of the village and the area shown in the annual papers as watered by it was verified. The depth, &c., and any defects in the well

or inferiority in the land were noted. The people were informed what sums I proposed to put on each well.

* * * * *

"I have no doubt that this mode of assessing wells is greatly preferable to the practice of fixing a rate for well lands and of leaving that rate to be applied to so much area as the patwari and the munsarim may have seen fit to class as watered by the well. I always provided myself with a list of the wells showing the areas irrigated by each in the last three years according to the annual papers, for it is not sufficient in these tahsils to take the figures of a single year. It often happens that a well-owner has in one particular year preferred to spread his well water over a very large area, so as to get it all sown with wheat. He will perhaps not be able to give the whole area more than one watering after sowing, but if there are good winter rains this will be sufficient to secure the crop, and he will gain more than by concentrating the water on a small space for the sake of a superior crop. But in another year he may adopt the opposite policy; or again of two wells of equal capacity one may be worked on the first and the other on the second of these systems. There will then be a great difference in the areas shown against the two wells. The figures therefore have to be taken with modifications. I have not assessed wells watering large areas at the same rate per ghumao as those watering small areas. Brackish water is often found in the Lower Rohi, and sometimes the advantage of irrigation is almost entirely neutralized by this cause. Wells in sandy land have been lightly assessed, for it is well known that such land profits much less by irrigation than a hard soil. A difference has been made between wells near the village and those at a distance. The more distant well lands are generally insufficiently manured. Few of these differences between one well and another could be allowed for, except on the system of putting a lump sum on the irrigation of each well."

The chahi rates must be understood as representing the average incidence of the abiána on the recorded chahi acreage.

17. In the following table the chahi and báráni rates adopted by Mr. Francis are shown side by side with those sanctioned for similar tracts in the Ludhiána district. The Jangal circle of the Ludhiána tahsil corresponds with Mahráj, the Upper and Lower Dhaia circles of Jagráon with Mr. Francis' Upper and Lower Rohi, and the Zíra Bet is a continuation to the south of that of Jagráon. Mr. Walker in Ludhiána had several classes of irrigated and unirrigated soils, but the rates below represent the incidence of the total well and dry assessments on the whole irrigated and unirrigated areas:—

Rates of	MAHRÁJ OR JANGAL.		MOGA OR UPPER ROHI.		LOWER ROHI OR ZÍRA.		BET OF ZÍRA.														
	Báráni.		Chahi.	Báráni.	Chahi.	Báráni.	Chahi.	Báráni.													
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.													
Ludhiána District ...	0	10	8	3	6	10	1	2	0	3	7	9	0	13	10	3	9	0	1	3	2
Ferozepore District...	0	9	2	1	6	3	0	13	10	1	5	6	0	13	2	1	3	8	0	12	0

The variation in the dry rates of the two districts is very much what might have been expected, for the rainfall and, generally speaking, the soil also fall off as we proceed southwards and westwards. The deterioration is specially marked in the Bet, and the difference between the eastern and western parts of the Zíra Bet is so great that Mr. Francis might well have put them in different circles. Moreover the rules adopted by Mr. Walker for the annual assessment of flooded lands tended to lower the general pitch of his Bet assessment, while, as will presently appear, Mr. Francis' system has the opposite effect.

The chahi rates look exceedingly moderate compared with those adopted in Jagráon, but in the upland circles the irrigated forms but a small proportion of the total cultivated area, and the rates applied to it had but little effect on the pitch of the assessment as a whole. In the Upper Rohi the wells are deep, in the Lower Rohi they are often brackish, and in the Bet the cylinders rest on sand and the wells are constantly breaking down. The recorded chahi area per well was also larger in Ferozepore than in Jagráon, especially in the Bet circles. In the Bet of the Ferozepore tahsil it is as high as 40 acres per well. The cultivation on the Ferozepore wells is probably inferior to that in Ludhiána, and the rents are certainly much lighter. In the upland circles, where a landlord takes half the produce of unirrigated lands, he only demands one-fourth of well crops.

18. The Bet lands reached by the floods of the Sutlej were put under ~~Assessment of inundated lands.~~ a system of assessment similar to that adopted to meet like circumstances in the Hoshiárpur and Jullundur settlements. The rates were sanctioned in the orders passed on the assessment reports, and are given in detail in the rules regarding the assessment of lands subject to river action which are printed in Appendix VI. These rules were approved by the Financial Commissioner in November 1889. They do not, to quote Mr. Francis' words, "aim at introducing anything that can be called a fluctuating system of assessment, but on the contrary have for their object the establishment of a suitable fixed assessment at as early a period as the circumstances of the land will permit." At the same time the rules are sufficiently elastic, if properly worked, to meet the changing conditions of lands exposed to river floods, and should secure much fairer results than the haphazard di-alluvion assessments made in former years. It will be observed that the rates are decidedly higher than those adopted for báráni lands. These rates were sanctioned by Government in para. 5 of the orders on the Zíra assessment report, for a term which would expire when the re-settlement of the Muktsar tahsíl was made, and the Settlement Officer was directed to give full details of the exact working of the system in his final report, when formal orders would be passed on the subject. Mr. Francis explained, however, that at the time of writing his final report only one year's results were available, so the matter is not yet ready for decision. He will by now have ascertained the effect of two years' further working of the rules, and should submit the required report before completing his work in Muktsar and Mamdot. The new assessments for Muktsar have been reported and recently sanctioned, but they will not come into force till the kharíf of 1893, and the Mamdot assessments a year earlier. Mr. Francis mentions that some complaints have been made to him in regard to the order of Government which directed that, where canal and river water mix in irrigating lands, such flooding should be treated and charged as canal irrigation, not as sailáb. This question should be further discussed by Mr. Francis in his report on the working of the river rules, to enable the matter to come again under the consideration of Government, if he thinks there is any reason in the complaints to which he refers.

19. The most difficult problem with which Mr. Francis had to deal was the ~~Assessment of lands~~ assessment of the lands irrigated by the inundation canals. ~~watered by inundation~~ These works may be said to have been constructed by the ~~canals.~~ people and Government jointly. The Government, as represented by the Deputy Commissioner and his subordinates, initiated and directed their execution, while the people supplied the necessary labour and have always paid for the cost of silt clearances and management. It had been distinctly laid down from the first that the use of the water of the river was only granted to the landowners free of charge until a new settlement should be undertaken. The general principles of land revenue assessment gave Government a right to claim a share of the increased value of the produce due to irrigation either in the shape of a fixed irrigated assessment or of a fixed dry assessment plus a fluctuating charge of the nature of owner's or water-advantage rate. In addition the State was entitled to a moderate royalty for the use of the river water, such as has been recently sanctioned in the case of the private canals of the Shahpur district. After careful enquiry Mr. Francis calculated that the value of canal crops in the Bet was midway between that of well and dry crops. There was much in the history of the canals and in the character of the irrigation they afforded to point to a very lenient water-advantage assessment over and above the fixed demand imposed on the land in its unirrigated aspect, and the Financial Commissioner with the approval of Government reduced by one-third the rates proposed by the Settlement Officer. A charge of $14\frac{1}{2}$ annas the acre is made for superior kharíf crops, or about one-fifth of the whole. The remaining kharíf and all rabi irrigation pays at half that rate. At the end of five years these rates are to be reconsidered. The measures now being taken to improve the canals should bring the irrigation under more effective control and diminish swamping. But on the other hand there is some reason to fear that the opening of the Sirhind Canal has diminished the supply at the beginning and end of the irrigating season, when water is especially wanted for the kharíf sowings and for the preparation of the land for rabi crops. The

canal revenue assessment for the two years 1888-89 and 1889-90 has averaged about 32,300 which is considerably in excess of the Settlement Officer's estimate.

In the Government orders on the Zíra assessment report, the question whether the fluctuating canal revenue taken on these inundation canals should be treated as a portion of assigned land revenue was reserved for further orders in dealing with Mr. Francis' final report. He has discussed the subject again in para. 17 of his present report. It seems to Mr. Rivaz that the question must be decided in favour of the revenue assignees who are affected. The canals in question are all private property. The fluctuating assessments which are charged on the lands irrigated from them represent the wet portion of the land revenue demand on such lands, and Mr. Rivaz can see no reason why, under our system of revenue assignments, a jágírdár or máfidár should not receive the benefit of these canal assessments as much as he does of the ábiána which forms the wet portion of the land revenue assessed by Mr. Francis on wells. It is true that, in the case of these private canals, the water they draw from the river is the property of Government, but if Government wishes to make any charge for the use of the river water, it can be imposed, after the passing of the new Canal Act, in the shape of a royalty, as has been decided in the case of the private canals in the Shahpur district. If such a royalty be hereafter imposed, it will of course be quite distinct from the land revenue demand on these canal lands and will in no case be claimable as assigned revenue. If this view is accepted, the 13th of the rules printed in Appendix V., which have not been sanctioned by Government, must be cancelled.

20. The general result of re-assessment was to increase the land revenue General result of re-assessment. by over 2½ lakhs or nearly 58 per cent. The absence of all complaint on the part of the people is a clear token of the judgment with which the village assessments were made, and the care taken in distributing the new demand over holdings. The assessments were given out under the orders of Government for a period of 30 years. They were introduced into Moga from the kharíf of 1887, and into the other two tahsils a year later, and might now be sanctioned for a term of 30 and 29 years respectively in either case. The right of Government to impose an owner's rate on lands irrigated by the Sirhind Canal at any time within the currency of the settlement was clearly asserted in the orders passed on the Moga assessment report; and, before the settlement is finally sanctioned, the landowners should be informed that, while Government does not at present intend to claim an owner's rate, it may do so hereafter. Mr. Francis' remarks on revenue management and the desirability of encouraging well sinking in the Bet by the grant of takávi loans should be noted by future District Officers.

21. As regards assigned revenue there is little to remark. In Mahráj Assigned revenue. the whole of the revenue is enjoyed by Sikh jágírdárs subject to a light commutation payment. The assignees are as a rule also owners of the land. Outside Mahráj the amount of assigned revenue is inconsiderable. Zaildárs are remunerated by a deduction of 1 per cent. from the land revenue, and ináms to the value of about 1½ per cent. of the new assessment have been given to landowners of influence. The system of álá lambardiárs is not in force in this portion of the district.

22. Mr. Francis' work in this settlement merits high praise. His Notice of officers. operations were concluded with commendable promptitude, and the financial results have been, as above shown, very satisfactory. His final report is, as already noticed, somewhat meagre in the account it contains of the new assessments, but the tahsíl assessment reports went very fully into all material questions and showed that Mr. Francis had acquired a thorough knowledge of his charge. The thanks of Government are also due to Munshi Nathu Rám, Extra Assistant Settlement Officer, and the other officers who are mentioned with approbation in para. 30 of the report. A map showing the main natural features and the assessment circles of the tract assessed should have accompanied the report.



No. 1432, dated the 23rd May 1890.

From—G. SMYTH, Esquire, Commissioner and Superintendent, Jullundur Division.

To—The Senior Secretary to Financial Commissioner, Punjab.

I HAVE the honor to submit herewith, for the orders of Government, the Final Report of the Revised Regular Settlement of the tahsils of Moga and Zira of the Ferozepore District and of that portion of the Ferozepore Tahsil which is not included in the jagir of the Nawab of Mamdot.

2. I have also, at the same time, to submit the revised edition of the Gazetteer of the Ferozepore District prepared by the Settlement Officer. In this edition of the Gazetteer the Settlement Officer has not furnished the statistical information for the Fazilka Tahsil acquired in the census of 1881. He has omitted this for the reason that the information referred to is included in the Gazetteer of the Sirsa District to which the Fazilka Tahsil till recently belonged, and in which the Revised Regular Settlement was concluded in 1883.

3. The tract under Settlement includes the northern and eastern portions of the Ferozepore District, and contains an area of 1,634 square miles. This area, except in the parts lying along the left bank of the Sutlej, is considerably mixed with the possessions of Native States. The Maharaaja of Patiala, the Rajas of Nabha and Jind and the Sardar of Kalsia hold areas which adjoin or are included in the limits of the Moga Tahsil, while the entire State of Faridkot may be said to be included in the Ferozepore District, being bounded, roughly speaking, on the east by the Moga Tahsil, on the north by that of Ferozepore and on the west by that of Muktsar. The Moga Tahsil also contains an outlying pargana known as the Mahrab, in which all the proprietors hold their lands revenue free. The city of Ferozepore itself, with a few villages adjoining, was the first portion of this tract which came into the possession of the British Government on the demise of the widow of the Sardar of Ferozepore in 1835. The Mahrab Pargana became British territory on the expressed wish of the inhabitants themselves in 1846. The remainder of the tract may be said to have been annexed on the conclusion of the first Sikh War; the possessions of the Ahluwalia Sardar, the Raja of Kapurthala, on the left bank of the Sutlej were annexed owing to that Chief's want of loyalty in the war, and the remaining territory, which had been acquired by Maharaaja Ranjit Singh through his General Diwan Mohkam Chand in 1808, became forfeited to the British Government on the defeat of the Sikhs at Sobraon. The Sultankhanwala Pargana lying between Ferozepore and Mudki belonged to the Faridkot Raja, but in 1852 was exchanged with that Raja for Kot Kapura and other villages appertaining to the Kot Kapura Pargana.

4. The physical characteristics of the area under Settlement, from an assessment point of view, are described in para. 12 of Mr. Francis' Report. There are, as described in the Gazetteer, three main natural divisions lying nearly parallel to the course of the river Sutlej, each of which varies but little within itself as regards the intrinsic qualities of its soil, but all vary very much in climate as the distance from the hills increases. These tracts, Mr. Francis explains, are in the form of wide alluvial shelves or plateaux; that to the east, which is the largest and includes nearly all the Moga Tahsil, being the highest; the next which includes the southern half of the Zira and the western half of the Ferozepore Tahsils, is about 15 feet lower, and the new alluvial lands, which make up the remainder of the two latter tahsils, is again a few feet lower than the second tract. The Mahrab Pargana, a detached portion of the Moga Tahsil lying to the south, is a portion of the first plateau, but differs materially in climate and other particulars from the more northern portions of the same tract. In the Gazetteer Mr. Francis has designated the first of these natural divisions of the country by the name of the Kot Kapura plateau, the second is called the Mudki plain, and the third is known as the Bet. The first is locally known as the Rohi, and the second as the Lower Rohi. Both the upland tracts are famous for their power of

resisting drought, and the more sandy soils are the most remarkable in this way. The wells in the upland tracts are few, the depth of the water in the Kot Kapúra plateau being too great for successful well cultivation, and in the Mudki plain the water is generally brackish. The Sirhind Canal traverses the Moga Tahsíl, but as no water-advantage rate is charged the existence of the canal is not taken into consideration in the assessment. The Bet country is irrigated to some extent by the inundation canals constructed by Colonel Grey when Deputy Commissioner of Ferozepore. The upland country is peopled almost entirely by Sikh Jats, who are thrifty and industrious cultivators. In the Bet the population is chiefly Musalmán, who, with the exception of the Aráins, are much inferior as tillers of the soil to the Sikh Jats. The consequence is that the people of the uplands are generally prosperous, while those of the Bet are poor and in debt. The principal harvest of the year is the rabi, and the chief crop is wheat.

5. The assessment circles into which the tract under Settlement was divided by Mr. Brandreth at the Regular Settlement of Assessment Circles, 1853-54 were twenty-eight in number, and followed the old Sikh divisions of the country. At the present revision of Settlement Mr. Francis, with the approval of the Commissioner and the Financial Commissioner, arranged to divide each tahsíl into two assessment circles. In Moga into the Moga and Mahráj Circles, and in Zíra and Ferozepore into the Rohi and the Bet, the Rohi being in these cases the Lower Rohi. All cultivated land was to be assessed in its unirrigated aspect, and the Government share of the profits on well and canal irrigation was to be taken in the form of a lump sum to be charged on each well, and by levying a fluctuating crop rate on lands irrigated by canals.

6. The fiscal history of the tract is given in paragraph 14 of Mr. Francis' Report. The Lahore and Ahlúwália Governments used to take their revenue in cash, but fixed the amounts for short periods only, and sometimes took grain instead. Their assessments pressed heavily on the Muhammadan population of the lowlands, and lightly on the Sikhs in the uplands, where the soil was much more fruitful than it seemed, and there was much room for expansion of cultivation. On annexation in 1846 a Summary Settlement was effected, based on the average of previous collections, but in some places a difficulty was experienced in obtaining payment of a cash revenue, and some villages refused to engage. The Regular Settlement was made by Mr. E. L. Brandreth, the Deputy Commissioner, in 1853-54, and it resulted in a slight increase of revenue. Mr. Brandreth did something to reduce the inequality of assessment between the uplands and the Bet, but still he left the former too lightly assessed in proportion to its productive power. The Regular Settlement was followed by several years of very low prices, in which the Musalmán proprietors of the Ferozepore Bet found a difficulty in paying a cash revenue, and many villages passed into the hands of farmers. The distress was increased by the famine of 1859-60, and a reduction amounting to about Rs. 4,500 was made in 42 villages of this tract. In the remainder of the district the assessment made at Regular Settlement has needed no alteration. In 1859-60 land first commenced to have a market value, and since then it has much increased in price. Land in some parts of the Moga Tahsíl now sells for 150 times the annual land revenue assessed upon it at Regular Settlement.

7. Between the year 1854, when the Regular Settlement commenced, and the year 1884 the increase of cultivation in the whole Development of resources. tract was very large, and in some places so great that the incidence of the revenue was little more than nominal. The increase was not so great proportionally in those parts where the conditions of soil and climate were superior. In the Bet lands the number of wells had nearly doubled, and extensive areas had been brought under irrigation by means of Colonel Grey's inundation canals. In the whole tract the cultivated area increased from 647,635 acres to 908,466 acres, the irrigated area from 48,938 acres to 85,038 acres, the latter not including the area irrigated by the Sirhind Canal, and the number of cattle from 125,203 to 291,609. The culturable waste has been reduced from 308,608 acres to 76,654 acres. Hence there has been an increase in cultivation of 40 per cent., irrigation of 93 per cent., and in

the number of cattle of 133 per cent. At the same time there has been a rise in prices of 45 per cent.

8. The tract under Settlement with the rest of the old Ferozepore District was settled by Mr. E. Brandreth in 1853, and an Preliminary operations. assessment announced for a term of 30 years. This Settlement constituted the first Regular Settlement. Proceedings in the present Settlement may be said to have commenced by a preliminary report on the financial prospects of a revision of Settlement having been made by Mr. T. G. Walker, who had previously settled the Ludhiana District in April 1884. The sanction of the Government of India to the commencement of operations was given in their Secretary's letter No. 531 R., dated 8th August 1884. Mr. Francis, the Settlement Officer, joined on the 3rd November 1884, and under Notification No. 275 of the 4th December of the same year a re-settlement of the tract, including both a revision of assessment, and a revision of the record of rights, was formally instituted. Mirza Azim Beg was first posted to the Settlement as Extra Assistant Settlement Officer, and joined before Mr. Francis' arrival, but on the 1st March 1885 he was succeeded by Nathu Ram.

The first steps found necessary on the commencement of Settlement operations were the correction of the Settlement record by the entry of a large number of mutations which had not been recorded, and the reduction of the patwari agency to a proper state of efficiency and discipline. As regards the former, 260,000 mutations were disposed of before the completion of Settlement, and this work caused considerable delay and trouble; out of 185 patwaris in office when Settlement commenced 41 had to be dismissed, 21 were retired on gratuities, and 18 resigned, making a total of 80. During Settlement the pay of the patwari establishment was considerably improved, the aggregate pay having been increased from Rs. 22,476 to Rs. 31,644, while a new grade of patwaris on Rs. 15 a month was constituted, and now no patwari receives less than Rs. 10 a month.

9. The system of measurement prescribed for this Settlement is that known as the square system, and under the careful guidance of Mr. Francis the success achieved has been very satisfactory. This result is due to the careful testing of the chains used with the standard chain, as well as to the careful instruction imparted to the patwaris and the subordinate Settlement staff; a comparison of the work done with that of the Survey Department nowhere showed a greater discrepancy than one foot per mile. The area which had to be measured amounted to 1,050,523 acres, included in 782 villages, and containing 618,009 fields.

The procedure adopted for the preparation of the record of rights was that prescribed by the Patwari Rules and by a manual of instructions, the material part of which has been incorporated in the Patwari Rules. The first steps have been the attestation of mutations to bring the old record up to date, and the preparation of the genealogical tree of the proprietors.

Before commencing the mapping of the fields the patwari provides himself with a number of slips known as the khatauni slips, each having at its head the particulars of the proprietary and other rights in a single cultivating holding, and spaces below for entering each field of that holding as it is met with in the course of the work; when work first commenced a khasra or field register was kept up, but subsequently in January 1886, with the permission of the late Colonel Wace, Financial Commissioner, the khasra was abandoned for the field book. In the latter no particulars as to rights, already sufficiently shown in the khatauni slips, are given, but merely the area calculations. This change proved most convenient and saved a great deal of time. Another alteration made on the same occasion was the discontinuance of the practice of writing on the map the length of each field boundary, it being determined to rely more on accurate plotting. This change may perhaps give rise to little inconvenience where the whole country is measured under the square system, as the error possible within the limits of a properly defined square must always be small, but in other places the advantage of the system is open to question. It certainly is an assistance to a Civil Court in determining a question of an alleged

encroachment of a proprietor on a neighbour's field to be able to obtain a record of the length of each side of the field, and the proprietors themselves place much reliance on a record of this nature in settling boundary disputes between themselves. In depending on accurate plotting and in the laying down of their boundaries from the map, the proprietors will be entirely in the hands of the patwári. In discussing this subject Mr. Francis makes a further suggestion of entering the khatauni number on the field in the map and thereby dispensing with the index to the field map. This suggestion, which, however, has not been put into effect, is also open to grave objection, as the khatauni numbers change on partition or other alterations in proprietary or occupancy rights, and the map is intended to be a permanent document to remain with the Settlement record for at least the term of Settlement.

10. The statistics having shown that a large increase of revenue might be expected in the Moga Tahsíl, owing to the great increase in the cultivated area, Mr. Francis at once commenced to

take measures to secure to Government the increased revenue in that tahsíl at the earliest possible date, the term of the Regular Settlement having already expired, accordingly he commenced his village inspections in the winter of 1886-87 and submitted his Assessment Report in April 1887. The orders of the Financial Commissioner on this Report were received in August 1887, and the revenue on the new assessment collected for the kharíf harvest of that year. In the other two tahsíls the new assessments were introduced with effect from the kharíf of 1888. The following table shows the increase of the new assessment over the old in all three tahsíls:—

		Old assess- ment.	New assess- ment.	Increase.
Moga	... ... ... ...	Rs. 2,40,237	Rs. 3,88,486	Rs. 1,48,249
Zíra	... ... ... ...	1,60,987	2,42,938	81,951
Ferozepore	... ... ...	79,866	1,28,077	48,211
Total	...	4,81,090	7,59,501	2,78,411

The new assessment in the Ferozepore and Zíra Tahsíls includes an item of Rs. 29,572, the estimated average annual amount of the canal revenue on the inundation canals.

The rates of the new assessment are as follows. These rates are all imposed on the land in its unirrigated aspect—

Moga Circle from 11 annas to 19 annas, average 14 annas per acre.

Lower Rohi „ 7 „ to 13 „ „ 11 „

Bet „ 7 „ to 17 „ „ 10½ „

Mahráj 9½

None of the assessments are progressive. The assessments on wells are generally equivalent to additional rates of from 5 to 10 annas an acre, or in other words the rates on lands irrigated by wells have been fixed at from 15 to 27 annas an acre.

11. The rates on crops irrigated by the inundation canals were fixed in Assessment on canal- terms of the local land measure at rates equivalent to irrigated lands. 14·5 annas an acre on the superior kinds of kharíf crops, viz., maize and rice, and 7·3 on all rabi crops and the inferior kharíf crops. These rates are in addition to any fixed assessment already borne by the land. They have been sanctioned for five years only, and will again come under consideration when the Settlement of the Muktsar Tahsíl is concluded. The

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application of these crop rates has in the year 1888-89 brought in a revenue exceeding the estimated average annual revenue by Rs. 4,109. The water of these canals, however, is not yet fully under control, and a supply of water cannot be looked for with certainty by the people; measures are being taken to secure greater regularity of supply, and, if these prove successful, it is hoped that the crop rates may be raised, as originally proposed, to 19.36 annas per acre on superior crops, and 9.68 annas on rabi and inferior crops by the year 1892-93.

There remains the question on which the Government have deferred passing orders until the receipt of this the Final Report. This question is whether assignees of land revenue are entitled to a share in these canal crop rates or not, such rates being levied under the Land Revenue Act. Mr. Francis appears at one time to have been of opinion that the revenue realized under such rates being land revenue the assignees had a right to it. Mr. Francis in para. 17 of his Report has fully discussed the subject for the orders of Government, and it remains to be decided whether the rates levied shall be considered as a royalty for the use of the water, or whether a share shall be considered as equivalent to a water-advantage rate to be enjoyed by the assignees. It may be here remarked that the jágírdár in the Ferozepore District whose interests will be most materially affected by whatever decision the Government may arrive at on this question is the Nawáb of Mamdot, whose jágír is still under Settlement.

12. About 9,000 acres of cultivated land are irrigated each year by the Assessment of lands in undated by the river. direct action of the river Sutlej. Parts of this area vary very much in productive power according as the deposit of silt is thin and recent, or is deep and of longer standing. A set of rules for the annual revision of the assessment of these lands based upon those in force in the Jullundur and Hoshiárpur Districts was prepared, and these rules were sanctioned by the Financial Commissioner in his Senior Secretary's No. 6891 of the 23rd November 1889. Under these rules sailáb lands under cultivation are arranged in three classes according to the crop grown thereon. Lands under inferior kinds of pulses or coarse rice sown broadcast and known locally under the name of *kharsu* form the 1st class, and are liable to the lowest rate of 9.68 annas per acre. Those lands capable of producing a successful crop of barley or gram form the second class, subject to a rate of 14.56 annas an acre, while the 3rd or highest class included lands capable of producing a successful wheat or other equivalent crop. The rate payable by lands of this class varies from 19.36 annas in the eastern part of the Zíra Tahsíl, where the rainfall is heaviest, to 14.56 annas in the south-western part of the Ferozepore Tahsíl, where the rainfall is less; uncultivated lands used as pasture are subject to an assessment of 10.89 pies per acre. The rates originally proposed by Mr. Francis were lower than those above mentioned, but were raised in accordance with the orders passed by His Honor the Lieutenant-Governor contained in para. 5 of the Government Review of the Zíra Assessment Report. Under orders contained in the same para., the assessment of 9 pies per *ghumáo* on pasture lands was imposed. In his Review also the Honorable the Lieutenant-Governor has only sanctioned these rates assessed on lands irrigated by the river Sutlej for a term which will expire when the re-settlement of the Muktsar Tahsíl is made, and has reserved passing formal orders on the subject until this the Final Report has been submitted by the Settlement Officer. Mr. Francis has not, however, been able, as desired by His Honor, to give a full detail as to the exact working of the system, as at present only one year's results are available, those for the year 1889 not being yet ready. He promises to submit a further report in 1891 when the re-settlement of the Muktsar Tahsíl may be expected to be completed. Mr. Francis brings to notice the dissatisfaction which the people have expressed as to the orders contained in para. 6 of His Honor's Review, under which canal rates are charged on lands which are partially flooded by the river.

13. Excepting the case of the canal-advantage rate, the term of Settlement has every where been fixed at 30 years, expiring in Term of Settlement. the case of the Moga Tahsíl at the rabi harvest of 1916-17, and in the other two tahsíls one year later.

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14. The cesses to be taken now stand as follows:—

	Rs. a. p.	Rs. a. p.
Village officers	{ Lambardárs... ... 5 0 0 per cent. Patwáris 4 11 0 , , }	9 11 0
Local rate	... ... ... 10 6 8 , ,	10 6 8
	<hr/>	<hr/>
Total	... ... ... 20 1 8	

15. At the Regular Settlement the revenue assigned or released amounted to Rs. 65,599, or 14 per cent. of the whole land revenue. Jágirs and mágás.

At the commencement of Settlement operations this amount had decreased to Rs. 50,577, or 11 per cent. The amount after revision cannot yet be stated, as final orders have not been received on the recommendations which have been submitted in favor of new grants, or for the continuance of some of those liable to resumption on the expiry of the term of Settlement. It may be noted that the whole of the Mahráj Pargana is held revenue free, and that the Government has surrendered the right of lapse in all cases excepting the jágir villages of the Bhái of Arnauli.

16. The zaíldárs appointed provisionally by Colonel Grey in 1882 in Zaíldárs. the Ferozepore and Moga Tahsils have all been confirmed in their appointments, though one or two of their circles have been modified. They owe their appointment to election. In Zíra zaíldárs have been selected for the first time but by nomination, and their appointments have been sanctioned by Government. Zaíldárs receive one per cent. of the revenues of their respective zails, both of the fixed demand and of the fluctuating canal assessments.

17. The revenue was distributed in the majority of cases as it was. Distribution of the revenue. assessed by an uniform rate on all cultivated lands. In some Dogar and Naipál villages near the river, and in a few others, a distribution according to shares was preferred, but in nearly 100 villages, in which the distribution had hitherto been made on shares, the proprietors elected to pay the revenue on areas in actual possession, thereby altering the constitution of the villages from pattiári to bhaiachára. In some cases in the uplands where certain sharers had reserved a portion of their lands for grazing purposes, the other sharers considered it was unfair that such lands should be held revenue free as subsequently they would probably be broken up for cultivation. The dispute was arranged by assessing half rates on such waste lands and by lightening *pro tanto* the rates on cultivation. The assessment on wells was distributed in the first instance on the number of pulleys used on the well, and afterwards by the number of turns taken on each pulley by each individual owner. The assessment on canal and river irrigated lands is paid according to the actual areas irrigated, though in the latter case revenue in some instances is paid according to shares.

18. Very few objections and only one appeal have been preferred. Objections and appeals. against the assessment, and the appeal was rejected. These facts are very creditable to Mr. Francis, whose method of working with the people has been such that all interested have been satisfied, although the revenue in the whole tract under Settlement has been enhanced by 56 per cent. Still more creditable to him is the manner in which the revenue has been distributed, against which not a single appeal has been preferred. I may add that the villagers of the Ferozepore District are a litigious race, as the records of the Chief Court and of the subordinate Civil Courts will show, so that their abstension from appealing is all the more remarkable.

19. The suggestions made by Mr. Francis as to the future revenue Future revenue management. management of the tract under Settlement are founded on a full knowledge of its capabilities, and should prove most useful in the future revenue administration of the district. The villages in the upland tracts are strong and can bear more than one bad season without any very serious results. Those in the Bet are weaker and require more careful

watching, especially if the inundation canals should at any time fail. More wells, Mr. Francis thinks, should be sunk in the Bet lands, and the people should be encouraged to take taccávi for this purpose.

20. The other points calling for notice in this Review are few. The ^{Remaining matters.} record of rights has been prepared in accordance with the rules on the subject, and contains the usual papers. A code of tribal customs has been prepared, which will be separately printed, and calls for no remark. The total cost of Settlement operations comes to Rs. 3,25,413-9-8, an amount which has almost been recouped by the enhancement of a single year.

21. Mr. Francis, it may be said, has been in charge of Settlement operations in the tract under Settlement from their commencement to their close, and considering the facts that the whole tract had to be remeasured, and the patwári agency was found in such an inefficient state, the work has been completed with commendable promptitude. For soundness and accuracy of detail the work will, I believe, stand the test of experience. Assessment work has been conducted with care and judgment, and the fact that so large an enhancement has been taken and so little objection been preferred speaks very favorably of Mr. Francis' tact and method of dealing with the people.

Mr. Francis speaks very highly of the character and services of Nathu Rám, the Extra Assistant Settlement Officer, and of his Superintendents he mentions favorably Shankar Dás, now Officiating as an Extra Assistant Commissioner, and Devi Sahái, Superintendent of the Moga Tahsíl; of Muhammad Afzal Khan he speaks less favorably. The Deputy Superintendents he has generally found worthless, the only exception being Ganga Rám, who is now employed as a Settlement Tahsildár in the Lahore District. From the Tahsildárs and the Náib-Tahsildárs attached to the District Staff the Settlement Officer generally did not derive much assistance, the only notable exception being Tára Singh, the Tahsildár of Moga.





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PREFATORY NOTE TO FINAL REPORT.

THIS report takes the place usually occupied in a final Settlement Report by the chapter or chapters on the settlement and assessment. It is an official report on the settlement operations. The descriptive matter formerly included in a final report is now to be found in the revised edition of the Gazetteer prepared by the Settlement Officer, and it is unnecessary to repeat it here. The Assessment Reports of the three tahsils have been printed, and this report though it may sometimes perhaps be separated, is intended to form a fourth volume of the same series with the Assessment Reports. As this arrangement renders recapitulation of the previous reports unnecessary, such matters as it remains to state can now be brought within a very moderate space, which is the more satisfactory for some of the assessment reports having been too long.

E. B. FRANCIS,
Settlement Officer.



FINAL REPORT
 ON THE
REVISION OF SETTLEMENT, 1884—1889,
 OF THE
NORTHERN PART OF THE FEROZEPORE DISTRICT.

1. This revision of Settlement includes the tahsils of Moga and Zira Tract under Settlement. and so much of the tahsil of Ferozepore as lies outside the Mamdot jágir, being that part of the Ferozepore District which was assessed for a period of thirty years in 1853-54. The area of this tract is 1,634* square miles.

2. A preliminary report on the financial prospects of the revision of Commencement of opera- Settlement was made by Mr. T. G. Walker, late Settlement Officer of Ludhiána, in April 1884. This will be found with other minor reports prefixed to the volume of the Moga Assessment Report. The sanction of the Government of India to the commencement of operations was given on the 8th August 1884 in their Secretary's No. 531 R. In the meantime some subordinate establishment had been sent in advance from the Hoshiánpur Settlement which was just then finishing. Mirza Azam Beg, Extra Assistant Settlement Officer, was deputed to supervise this establishment, under the control of the Deputy Commissioner, in April 1884.

3. On being appointed to the charge of the Settlement, I joined on the Officers in charge of 3rd November 1884, and on the 4th December, by a Notification No. 275, which is given in the Appendix, a re-settlement of this tract, including both a revision of assessment and a revision of the record of rights, was formally instituted. The Superintendents and the remainder of the subordinate establishment joined on various dates in January and February 1885. On 1st March Mirza Azam Beg was succeeded by Munshi Nathu Rám, Officiating Extra Assistant Settlement Officer. No further change has taken place in the offices of Settlement Officer and Extra Assistant Settlement Officer, except that the Extra Assistant Settlement Officer was in 1886 deputed for two months to special work in the Kánpur District, and took privilege leave for 20 days in 1888, his place on both occasions remaining vacant for the time.

4. The former Settlement record being more than thirty years old, and Progress of operations: maps and records. having been made when the district was in a very undeveloped state, it was found that an enormous number of changes had to be made in the record of rights. The work of writing up such changes in mutation registers had occupied Mirza Azam Beg and his establishment for several months, and continued for some time longer to be the most urgent work in hand. Before the arrival of the Superintendents it fell to the Settlement Officer and Extra Assistant Settlement Officer to pass orders themselves in all cases involving any dispute or any elements of doubt or difficulty, and about 6,000 such cases were disposed of by myself and Mirza Azam Beg in the cold season of 1884-85.

5. The patwáris in this district, notwithstanding efforts which had been made by Colonel Grey, while Deputy Commissioner, to bring Patwáris. them to a state of efficiency, were generally found to be of

					Square miles.
• Moga	...	...	...	814	
Zira	...	...	...	466	
Part of Ferozepore	...	...	...	324	
Total	...			1,634	

an inferior stamp. Those of the Ferozepore Tahsíl, especially those near the city, were the weakest.

TAHSIL.	Number of patwáris.	Number of Hindi writers.
Ferozepore ...	88	14
Zira ...	68	8
Móga with Mahráj ...	90	12
Total ...	186	84

A large percentage of them, as shown in the margin, were unable to write the Urdu character. Many lived in the city and spent very little time in their circles. Crop statements were often filled up without seeing the fields, and instances came to notice of a patwári making one crop statement serve for two or more years without even taking the trouble to disguise the trick by superficial alteration of the figures. The rule requiring the patwári to reside in their circles was openly disobeyed, and they were in the habit of absenting themselves at pleasure, without leave, to visit their homes or to attend to their private affairs. I should probably have been justified in the interest of the Settlement work in taking much more sweeping measures than I did with respect to inefficient patwáris. But as much of the work was novel and difficult even to good patwáris, the Patwári and Kánungo Rules having just been issued when our operations commenced, it was not easy to pronounce on short acquaintance of every ignorant and clumsy man whether he was quite incapable of being taught and improved. A very liberal period was therefore allowed to the patwáris to show whether they would do better as they went on. I hardly regret having adopted this policy, but one result of it of course was that operations were somewhat delayed and some work spoiled by bad men whom it would have been better to remove at the outset. The Hindi writers were reduced to a single man, who was succeeded by his son at the conclusion of operations. The number of patwáris was increased from 185 to 206. Of the whole number found in office at the commencement of Settlement operations 18 resigned, 41 were dismissed, and 21 were retired on gratuities. Two patwáris were convicted by me of fraudulently falsifying their papers, and were sentenced to a year's rigorous imprisonment in each case. The pay of the whole patwári establishment was considerably improved, a new higher grade on Rs. 15 being introduced, and the aggregate pay being increased from Rs. 22,476 to Rs. 31,644. No patwári now receives less than Rs. 10 per mensem. There are 15 assistant patwáris who are paid Rs. 7 per mensem. The Patwár fund of the whole district had, on the introduction of the new assessments, a surplus income of about Rs. 4,500 besides a good opening balance, and the cost of patwáris' stationery can be met from this fund without calling upon the zamíndárs for an extra contribution for the purpose.

6. The system of measurements prescribed for this Settlement was the square system as laid down in the Vernacular measurement manuals of 1884. This system, though then a novelty, has now become too well known to need much description, especially as it has been embodied by me with some subsequent improvements in a manual issued in 1888, both in English and in Vernacular. The principle on which it is founded is that in a plain country men of the patwári class can be taught to make linear measurement with a chain much more accurately than they can take angles by means of a plane table. If the chainmen are properly drilled, they can chain a line without a greater error than one in 2,000. They can therefore, by verifying the length of the hypotenuse of a right-angled triangle, secure the correctness of the right angle within two or three minutes. This is a degree of accuracy which cannot be attained with any but a very expensive angular instrument. Making use of this principle correct perpendiculars of uniform length are laid off at uniform distances from a measured base near the centre of each village, and their ends being joined squares are formed. The lines of these squares are then prolonged, and the new angles verified by measuring their hypotenuses. Thus a net work of uniform squares is constructed, which embraces the whole area of the village. This forms the framework of the map. The distances at which the sides and diagonals of the squares cut the boundaries of fields are recorded in a rough register. Mapping sheets are supplied ready ruled with squares which, on the scale it is

intended to use, will correspond with the squares constructed on the ground. In order to map the fields the positions of all intersections recorded in the field book are marked on the ruled lines of the map, and the position of field corners and of other points as regards these lines is fixed by means of a cross staff, and plotted down accordingly. The squares are chosen of such a size that in the longest distance which it will ever be necessary to take with the cross staff, no error large enough to show on the map shall be likely to occur. The size of square adopted in this Settlement was 1,000 feet each side on the ground corresponding to 5 inches each side on the map. In this system of measurement the patwári has to deal with no angles but right angles, and requires no instruments but the chain, the cross staff, and a divided scale with a few transverse lines marked across it at right angles to its edge.

7. It had been arranged between the Financial Commissioner and the Survey Department that the latter, in place of making an independent topographical map of this district, should obtain topographical details from the patwáris' maps. In order to secure the patwáris' maps being correct enough for this purpose, it was arranged that the Survey Department should first make a skeleton map of the district on the scale of two inches to a mile, fixing down by a traverse survey the position of most of the village triple-junction points, and giving the distances round the village from one to another of the points fixed by them. The Settlement Officer was directed to satisfy himself that each of such distances was the same on his own maps as the Survey Department had made it to be. After the maps had passed this test they were to be made over to the Survey Department for reduction to the scale of the skeleton map above mentioned. Much doubt was expressed in some quarters of the possibility of getting patwáris' work to satisfy these conditions. It was evident to me that the first essential of success in this respect was that the patwáris' chains should be kept true to the standard length, for if the length of the chain was incorrect all the squares laid down with it would be too large or too small, and the distances between points deduced from their positions in the squares would be too short or too long. I therefore took pains to make correct standards of length and to see that the chains in use were always kept in agreement with them.

8. The first steps in starting the measurement work were taken in the end of December 1884, by collecting the patwáris at a few central places to teach them how to lay out squares. This work was quite strange to all grades of the establishment, not one of them ever having seen it done before, and we experienced some of the usual difficulties which attend the introduction of a new system among ill-educated men. Those officials who had practised other methods of surveying had of course to unlearn first most of what they thought they knew. But as soon as they were induced to follow a sound mode of going to work nearly all hands rapidly became expert. The statement in the margin* show the number of squares laid out in each month from the commencement of the work up to the hot-weather recess of 1885. After a short time it was found that the patwáris so seldom required to alter a square once laid down that it was possible to make a great improvement upon the procedure prescribed in the manual of 1884. In that manual it was assumed that the squares would all have to be laid out first, and that the chain would have to be taken over all the square

* Months.	Number of squares.
January 1885	1,779
February	3,388
March	8,927
Part of April	453
May	14,657
Part of June	10,944

lines a second time in order to note the distances at which intersections of field boundaries occurred. But we found that there was nothing to prevent our commencing the register of intersections as soon as the first square was laid, and recording the intersections as each line was laid down. By reducing these two stages to one we saved our men about 80,000 miles of chaining. A statement of the distances deduced from our square work in one village were sent on in advance to the Survey Department for verification, their data not yet having reached us, and it was found that discrepancies nowhere amounted to so much as a foot per mile.

9. The procedure adopted in this Settlement for the preparation of the record of rights was that prescribed by the Patwári Rules and by a manual of instructions, the material part of which

has since been incorporated in the Patwári Rules. It is, therefore, unnecessary to enter into much detail here. Before commencing the mapping of the fields the patwári provides himself with a bundle of slips called khatauni slips, each having at its head the particulars of the proprietary and other rights in a single cultivating holding, and spaces below for entering each field of that holding as it is met with in the course of the work. Each right-holder has a duplicate of his own slip or slips given to him. In order to get the series of holdings quite complete the people of the village are collected, and brief genealogical trees of each family are made out, so that every man's name may be placed in its natural order according to the constitution of the village. Other right-holders are added from the jamabandi of the preceding year. These genealogical trees are written side by side on a long folding sheet, which in a large village extends to many yards. At the commencement of our operations a khasra or field register was kept up in which all particulars of rights in each field were entered in serial order as the field was measured. In the same register were also shown details of the dimensions of the field and the calculations by which its area was obtained. In January 1886, however, the late Colonel Wace, Financial Commissioner, after inspecting the work of the Settlement, gave us permission to abandon the khasra and to replace it by a simpler and rougher form of register now called the field book, in which no particulars of rights are given, these being already sufficiently recorded in the holding-slips, but merely the area calculations. The relief afforded by this change was considerable, for with most patwáris it was found impossible to keep the area calculations free of errors and alterations, which disfigured the khasra. The field book not forming a part of the legal record, the existence of such blemishes in it mattered less. Another more important advantage gained was indirectly obtained by the abolition of the khasra. In the case of the large villages which cannot be completely mapped in a single season many changes of rights occur while the work is in progress. It is of course desirable to incorporate these in the papers as they occur, so that at the conclusion of the work the record may show the state of facts correctly up to date. But while there was a khasra in which entries once made could not be changed without spoiling the book, it was impossible to do what was desired. The khatauni slips being removable and the field book being open to alterations this difficulty was quite got over as soon as the khasra disappeared, and we have been enabled to show thousands of changes which under the former system must have been ignored. Among them is the insertion of new canal distributaries. Another alteration made by the Financial Commissioner's orders on the same occasion was that the practice of writing on the face of the map the length of each part of a field boundary was discontinued as unnecessary and cumbrous. It was determined to be better to insist on correct plotting of boundaries and not to rely on written dimensions to remedy the effects of bad plotting. This also was, I believe, a sound measure. The field boundaries in many villages in this district are so curved and crooked that a note of the length of each section of them is of no use whatever to any one wishing to relay the boundary, nor does the authorized method of relaying a lost boundary, as given in the new measurement manual, require the aid of such dimensions, nor are they wanted for the purpose of calculating areas. The appearance of the maps has been improved by the omission of these crowded numerals, and it has become possible to introduce a further improvement in showing on the map within each field the number of the holding to which it belongs, so that an index can be dispensed with. One further great improvement has now been made in the rules, but not in time for us to act upon it in this Settlement. This is the authorization of a much simpler method of calculating areas than was before prescribed. The rule by which we worked was to divide the field into two sides by drawing a diagonal through it from one to another of the opposite corners, and then to divide each of these sides into parallel strips, or triangles, by dropping perpendiculars on the diagonal from each bend in the boundary. This method often required us to make 30 or 40 separate parts of a single field and to calculate the area of each part by itself. In so much arithmetical work many mistakes were apt to occur, and the mass of figures was so formidable that the supervising staff were unable to thoroughly check it.

The present method proceeds on the observed fact that most fields approximate to the form of a long rhomboid, and that their area can therefore be

accurately obtained by multiplying the mean length by the mean breadth. Irregular fields can be broken up into a very few rhomboids or triangles. The calculations are now shorter by 40 per cent. than they were under the former system, and the chance of superior officers really looking into the work is proportionately increased.

10. The area of the tract to be measured was 1,050,523 acres containing Extent and progress of work. 618,009 fields. The number of villages was 782, and the number of cultivating holdings was 155,761; thus the average size of a field was 1.7 acre, of a holding 7 acres, and of a village 1,347 acres. The size of villages, however, varied very much in the different natural divisions of the district, which will hereafter be described. The average size of a village in the uplands was about 2,250 acres, and in the lowlands near the river about 675 acres. Field measurements were begun in October 1885, immediately after the patwáris had done their jamabandi work for that year. The statement given as Appendix No. 2 shows the progress made in measurement work in each year of the duration of Settlement operations.

11. It is now the rule that during the continuance of Settlement operations no part of the ordinary annual routine duties of the Patwáris' annual work. patwáris is to be neglected or set aside. He makes his three annual crop inspections, prepares his jamabandi, does alluvion and diluvion work, keeps up his diary, makes báchh papers, and attends at measurements of canal irrigation just as if no Settlement were going on. These ordinary duties take up nearly half his time, and leave him on the average only about 6½ months out of the twelve for measurement work. Moreover, it is insisted on that each patwári shall measure up his whole circle almost unaided. Thus the measurements which in former Settlements used to be finished in 1½ or 2 years now take at least 3 years. But in the meantime the patwáris have year by year been preparing more and more correct statistics on the basis of the former field numbers, which are entered, as they are prepared, into the nine statements (corresponding with the agricultural returns annually submitted to Government) which make up the village note-book. This book is prepared both in English and Vernacular, and is completed by the addition of a tenth statement comparing the rates, &c., of former and present Settlements; to this the Settlement Officer finally appends his own remarks on the condition of the village, and his reasons for the assessment which he fixes. Unless the old measurements are much worse than those of the Regular Settlement of this district were, on the whole, found to be, these statistics are sufficient for the Settlement Officer's purpose, or at least they are sufficient in a district where the agriculture is so simple as in Ferozepore.

ASSESSMENT.

12. In September 1886, about a year after the institution of field measurements, I submitted a preliminary report according General description. to rule on the scheme of assessment circles which I proposed to adopt. The physical conditions of the tract under Settlement are simple. There are as described in the Gazetteer three main natural divisions lying nearly parallel to the course of the Sutlej, each of which varies but little within itself as regards the intrinsic qualities of its soil, but all vary very much in climate as the distance from the hills increases. These tracts are in the form of wide alluvial shelves or plateaux; that to the east, which is the largest and includes nearly all the Moga Tahsíl, is the highest; the next, which includes the southern half of Zíra and the western half of Ferozepore Tahsíls, is about 15 feet lower; and the new alluvial land along the riverside, which makes up the remainder of the two latter tahsíls, is again a few feet lower than the second tract. The Mahráj Pargana, which is a detached part of the Moga Tahsíl lying to the south of the main block is really on the same plateau as Moga itself, but differs materially in climate and in other matters. In the Gazetteer which relates to the whole district, including Muktsar, Mamdot and Fázilka, I have called the tract to which Moga belongs the *Kot Kapura plateau*, Kot Kapura being intermediate in position between the Moga and Muktsar portions of it. The intermediate level I have designated the *Mudki plain*, Mudki in the Ferozepore Tahsíl being near the middle of it. The Kot Kapura country is locally known as the *Rohi*, and the Mudki plain may be distinguished as the *Lower Rohi*. The riverside tract

is known as the *Bet*. The upper plateau has a smooth uniform soil, consisting of sandy loam. In the main part of the Moga Tahsíl this is diversified only by sand-drifts lying along the course of old streams, but in Mahráj the sand-hills become the main feature of the landscape. The Mudki plain is nearly all a red or yellow sand on the surface with a subsoil of sandy loam. Both the up-land tracts are famous for their power of resisting drought. The sandier soils are the most remarkable in this way, but the loam produces much better crops in average and good years, and is much more highly valued. The soil of the *Bet* is generally a hard dark loam with very little sand in it. It requires much rain and quickly dries up, so that except in the east side of the Zíra Tahsíl it can hardly be cultivated successfully without the aid of irrigation. The Moga plateau has a few wells on its eastern and northern edges, but elsewhere the depth to the water level is too great for irrigation. In the Lower Rohi, or Mudki plain, the water is not out of reach, but it is generally brackish. The Sirhind Canal traverses the Moga Tahsíl, but as no water-advantage rate is charged on this canal we took no account of its existence in our assessments. The *Bet* country is watered by inundation canals constructed by Colonel Grey, C.S.I., when Deputy Commissioner here in 1875-78. The correspondence regarding these canals has been printed as Selections from the Record of the Financial Commissioner's Office, No. LXI. The inhabitants of the uplands are nearly all Sikh Jats of fine physique and careful habits. There are a few Musalmán villages in the Lower Rohi. The *Bet* is almost entirely Musalmán, the tribes on the river being Gújars, Naipáls and Dogars, and those inland mostly Araíns. The people of the uplands are almost invariably prosperous, but those of the *Bet* are generally poor and in debt. The system of cultivation in the uplands is extremely simple, consisting of a Rabi crop of wheat or barley mixed with gram and interspersed with rows of rape, which is followed by a Kharíf crop of *jowár* (seldom *bájra*) mixed with *moth* and other lentils. The Rabi occupies about twice the area of the Kharíf. On the wells maize is grown. In the Lower Rohi there is little kharíf. In the *Bet* the main crop is wheat. As a rule only one crop is raised yearly even on well lands except in the east of Zíra and near towns.

13. I proposed to make only two assessment circles in each tahsíl, *viz.* in the Moga Tahsíl *Moga* and *Mahráj*, and in each of the Assessment Circles. other tahsíls a *Bet* and a *Rohi* Circle, the Rohi here meaning the Lower Rohi. I pointed out that in the Moga Circle the north-eastern villages on Ludhiána border were decidedly better than those to the south and west; also that in Zíra the eastern part of the *Bet* was much superior to the western part in many respects. But I considered that it would be quite easy to take account of such differences when making village assessments, and that it was unnecessary to complicate the district agricultural returns in perpetuity by making more circles on account of differences of degree rather than of kind. These proposals were approved by the Commissioner and Financial Commissioner. The circles formed at the Regular Settlement in 1853-54 were founded on the old Sikh Ilákás, and were twenty-eight in number. Some of them had since been distributed over different tahsíls. It was, therefore, impossible to follow the old arrangement. I proposed to first assess all cultivated land at a general rate on its unirrigated aspect, and to take the Government share of profits due to well and canal irrigation in a separate form, *viz.*, by assessing a lump sum on each well with reference to its irrigating capacity and other advantages, and by levying a fluctuating rate on canal-irrigated crops.

14. With the exception of Ferozepore itself and a few villages around it, which came into the possession of the British Government on the demise of the Sardár's widow in the end of 1835, and the Mahráj Pargana, the whole of the tract under Settlement was annexed after the campaign of 1845-46. A large portion of the *Bet* had been under the rule of the Ahlúwália Chief (Rája of Kapurthala), and was taken from him on account of his want of loyalty during the campaign. The rest of the territory had come into Mahárája Ranjit Singh's hands by the conquests of Diwán Mohkam Chand in 1808. The Sultánkhanwála Pargana between Ferozepore and Mudki had belonged to Farídkot, and was acquired from the Rája in exchange for some Kot Kapura villages in order to get a more uniform frontier line. The

Lahore and Ahlúwália Governments used to take their revenue in cash, but fixed the amount for short periods only, and sometimes took grain instead. On annexation Summary Settlements were made on the basis of former average collections. There was in some tracts a difficulty in getting revenue paid entirely in cash; some villages refused to engage and lost their proprietary rights. The Regular Settlement was made by Mr. E. L. Brandreth, Deputy Commissioner, in 1853-54. The general result was a small increase of the revenue. The river-side tract, where there is much moisture, old established cultivation and a Musalmán population, was, generally speaking, highly assessed under the Sikh Governments and also in the Summary Settlements. In the uplands, on the other hand, where the soil, though not irrigated, is nearly drought-proof, and where there was much room for expansion of cultivation, the people being of the same caste as their rulers paid little. Mr. Brandreth did something to rectify these irregularities, but he certainly left the uplands more lightly assessed than the Bet. Mr. Brandreth's Settlement comprised the Muktsar Pargana as well as the tract now under revision, but in Muktsar the Assessment was sanctioned for only 10 years, and was revised in 1872 by Mr. Purser for a term which has not yet expired. The Regular Settlement was followed by several years of very low prices, during which the Musalmán proprietors of the Ferozepore Bet found a difficulty in meeting their engagements in cash, and many villages fell under farmers. The distress was increased by the famine of 1859-60. At length a reduction of about Rs. 4,500 was made in 42 villages in this tract. In the rest of the district the assessment made at the Regular Settlement has needed no alteration. In the famine of 1859-60 land first began to have a market value; many landholders were driven to borrowing, and the money-lenders for the first time began to advance large sums upon landed property. The price rapidly rose until it probably bore a higher ratio to the current land revenue than any where else in the Province. Unirrigated land in Moga sells for Rs. 70 and Rs. 80 per acre, equal to 150 years' purchase of the old revenue.

15. Between 1854 and 1884 the increase of cultivation in the whole tract was very large. In the western part of Moga and Development of resources. in many parts of Lower Rohi it had been such that the incidence of the revenue had become almost nominal. In the better parts of Moga and Zíra there had not been so much waste land left in 1853-54, and so the cultivation had not increased in so great a ratio. In the Bet the number of wells had more than doubled since the Regular Settlement, and large areas had been brought under cultivation by the help of the inundation canals. The following table shows in a brief form some main items in the development of the district:—

TASIL OR PARGANA.	TOTAL AREA.				CULTIVATED AREA.				IRRIGATED AREA.				POPULATION.				NUMBER OF LARGE CATTLE.	
	Regular Settlement.		Present Settlement.		Regular Settlement.		Present Settlement.		Regular Settlement.		Present Settlement.		Regular Settlement.		Present Settlement.		Regular Settlement.	
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Moga	... 520,761	... 521,106	... 370,941	... 482,006	... 1,14,470	... 16,971	... 4,755	... † 5,177	... 130,264	... 221,169	... 60,291	... 141,059						
Lower Rohi	... 248,479	... 246,127	... 151,971	... 224,106	... 77,712	... 12,006	... 6,722	... 10,847	... 64,985	... 101,403	... 27,847	... 58,630						
Bet	... 271,857	... 278,560	... 124,720	... 202,354	... 116,426	... 47,677	... 32,461	... 69,014	... 80,798	... 185,113	... 37,065	... 91,920						
Total	... 1,041,097	... 1,045,793	... 647,635	... 908,466	... 308,608	... 76,654	... 43,938	... 85,038	... 276,047	... 507,685	... 125,203	... 291,609						

* Including Rohi Circles of Ferozepore and Zira.

† Exclusive of Sirhind Canal irrigation.

Thus the cultivated area had increased by 40 per cent., irrigation by 93 per cent., population by 84 per cent., and cattle by 133 per cent. At the same time the price of grain had increased, as shown in a separate report printed in the volume of the Moga Assessment Report, by about 45 per cent.

Rents in cash were hardly known at the time of the Regular Settlement. But cash is now generally paid all over both the upland tracts. The rates are from Rs. 2 to Rs. 3 in the Lower Rohi, and from Rs. 4 to Rs. 6 in Mahráj and Moga.

16. It was evident from the statistics that a great increase of revenue must be obtained in the Moga Tahsíl on account of the Assessment work. increase of cultivation and the rise of prices, and that every season's delay would cause great loss to Government. It also appeared that the assessment of this tahsíl, in which the soil is nearly uniform in quality, the people nearly all of the same class, and all with hardly an exception very prosperous, would be an easier task than either of the riverside tahsíls would present. I therefore undertook the village to village inspection of Moga in the cold season of 1886-87. The Assessment Report was submitted in April 1887, and the orders of the Financial Commissioners were received in August 1887. The new assessments were introduced from the kharíf season of 1887-88. In the succeeding cold weather the two remaining tahsíls were inspected, the Assessment Report of the Zíra Tahsíl was submitted in February 1888, and that of the Ferozepore Tahsíl in May 1888. Orders of Government were received in November and December 1888, and the assessments were put in force from the kharíf season of 1888-89.

The results of the new assessments were as follows:—

TAHSIL OR PARGANA.	Old assessment.*	NEW ASSESSMENT.		Total.
		Fixed assessment.	Estimated revenue from canals.	
Moga	Rs. 2,40,237	Rs. 3,88,486	Rs. ...	Rs. 3,88,486
Lower Rohi	1,14,545	1,69,941	+ 29,572	3,71,015
Bet	1,26,308	1,71,502		
Total ...	4,81,090	7,29,929	29,572	7,59,501

* According to the figures for 1885-86 in Moga, and 1886-87 in the other tahsíls.

† See para. 17 for results for the year 1888-89.

By tahsíls the increases were as follows:—

TAHSIL.	Old assessment.	New assessment.	Increase.
Moga	Rs. 240,237	Rs. 3,88,486	Rs. 1,48,249
Zíra	1,60,987	2,42,938 { 2,22,313 * 20,625	81,951
Ferozepore	79,866	1,28,077 { 1,19,130 * 8,947	48,211
Total ...	4,81,090	7,59,501 { 7,29,929 * 29,572	2,78,411

* Estimated amount of canal revenue.

The unirrigated rates of the new assessment varied from 19 annas to 11 annas with an average of 14 annas per acre in Moga, from 13 annas to 7 annas

with an average of 11 annas in the Lower Rohi, and from 17 annas to 7 annas with an average of $10\frac{1}{2}$ annas in the Bet. The rate in Mahráj was $9\frac{1}{4}$ annas per acre. These rates are those of the assessments finally ordered by the Financial Commissioner and Government. My own proposals were for rates about $\frac{3}{4}$ anna lower in the Bet, while in Moga I was prepared to go nearly $\frac{3}{4}$ anna higher.

None of the assessments were progressive; no charge was made on uncultivated land. The sums assessed on wells vary considerably according to the area irrigated by a well. In the Ferozepore Bet very large areas are watered from a well, but the crops grown are poorer than well crops elsewhere. The well assessments were generally equivalent to additional rates of from 5 to 10 annas per acre on the area usually irrigated in each year, and so when added to the rate on the land in its unirrigated aspect had the same effect as if rates on well land had been fixed at from 15 annas to 27 annas per acre.

17. The rates on crops irrigated by the inundation canals were fixed in terms of the local land measure at rates equivalent to irrigated lands.

Assessments on canal. 14.52 annas per acre on the superior kinds of kharíf crops and 7.26 annas per acre on the inferior kinds of kharíf and on all rabi crops. These rates are to be paid on the crops actually irrigated during each season in addition to any fixed assessment already borne by the land. The principal crops classed as superior kharif are maize and rice. Rules for the preparation of demand statements for the canal assessments, for the disposal of objections to the assessment, &c., were submitted by me in January 1889, and were sanctioned by the Financial Commissioner in his Secretary's No. 1489 of 7th March 1889. One question relating to the canal-advantage revenue still requires decision. I had at first assumed that, as this charge is imposed not under the Canal Act but under the Land Revenue Act, the revenue would be treated as a part of the ordinary land revenue in respect of the claims of assignees of land revenue, so that the holders of revenue-free plots would be exempt from canal-advantage rates upon the area of such plots, while, on the other hand, the holders of jágír assignments would be entitled to receive the canal rates paid by their jágír land. But in the orders of Government on the Zíra Assessment Report, para. 6, His Honor the Lieutenant-Governor declined to pass orders on this point at the time and directed it to be brought forward again in the Final Report. A further reference on this subject was made by the direction of the Financial Commissioner in my No. 8 of 15th January 1889. The right of Government to distinguish this part of the revenue from other parts (well assessments for instance) rests on the fact that Government has an exclusive right to the water of the river. When the inundation canals were commenced by Colonel Grey the permission of Government to take the water was applied for, and was granted on the condition that its uses should be enjoyed free of charge for the term of Settlement, of which term about 8 years then remained, and that in the new Settlement a light water-rate would be imposed by way of royalty. Whether the whole of the canal-advantage rates now imposed should be regarded as forming the Government royalty in the river water, or whether a part only should be set aside as pure royalty, and the remainder should be treated as analogous to well-advantage revenue, or to extra assessment on naturally inundated land (in both of which kinds of revenue assignees have their share), it is for Government itself to say, and it does not appear necessary for me to offer any opinion. I may, however, observe that in one or two cases where a jágír village was formerly irrigated by wells and the wells have now been superseded by canal-irrigation the jágírdár will be a loser if he gets none of the canal advantage rates, and further that the decision now given, whatever it may be, will have a very important application in the case of the Mamdot jágír in which a revision of Settlement is now commencing. In Ferozepore and Zíra the canals were made and are maintained by the irrigators without any help from Government. The villagers execute annual clearances of silt and other necessary works in tasks proportioned to the area for which each village has received water in the preceding year, and they pay a rate of about $2\frac{1}{2}$ annas per acre for the salaries of the Extra Assistant Commissioner in charge of the canals and his subordinate staff. I originally proposed canal rates $\frac{1}{2}$ higher than have been sanctioned. These

rates have been sanctioned for only five years, after which, when the Muktsar Tahsíl comes under Settlement, they will be reconsidered. The sums actually obtained by the application of the canal crop rates in the year 1888-89 compare as follows with the estimate entered in the Assessment Reports, which estimate was made according to the averages of the three preceding years:—

TAHSIL.	Estimated.*	Actually assessed in 1888-89.	Difference.
Ferozepore	Rs. 8,947	Rs. 9,491	Rs. +544
Zíra	20,625	24,190	+3,565
Total ...	29,572	33,681	+4,109

After allowing for the reduction of 25 per cent. made in the rates.

The main reason for lowering the rate was the uncertainty of the supply of water and the occurrence of positive damage in many places on account of the water not being fully under control. Steps are being taken to provide better means of regulating the supply, and for this purpose a grant-in-aid has been promised by Government. If by 1892-93 this object has been fairly attained the rates originally proposed of 19.36 annas per acre on superior crops and 9.68 annas on other crops will not be felt at all too heavy.

18. The area annually wetted by direct inundation from the river comprises about 9,000 acres of cultivated lands. Much of this undated by river. is soil which has only recently been deposited by the river, and has not yet been thoroughly cleared and brought into order. Some of it is too thin a deposit to produce good crops, and some lies so low that it is not out of water long enough in the year for regular tillage. This land, until it comes up to the full standard, is subject to annual revision of assessment, upon a system under which the fact of certain classes of crop having been successfully grown is taken as the criterion of the quality of the land. Land that has never grown other crops than *massar*, *churál* and a kind of coarse rice (*kharsu*), which is sown broadcast on the inund, pays the lowest rate. As soon as such crops as gram and barley have been grown the land is raised to the second class, and the first successful crop of wheat or of other grains which are classed with wheat raises it to the highest class. The change in the assessment is always from a lower to a higher class; the rate once fixed is never lowered unless the soil be carried away by the river or overlaid with sand, or unless it falls altogether out of cultivation. But land which has altogether ceased to be reached by river floods may be removed from the inundated class and assessed at unirrigated rates. A set of rules based upon those sanctioned for the Hoshiárpur and Jullundur Districts, where a similar system of alluvial assessments prevails, has been drawn up and was submitted in April 1889, and was sanctioned by the Financial Commissioner in his Senior Secretary's No. 6891 of 23rd November 1889. This highest rate upon inundated land in this district is equal to 19.36 annas per acre. The rate applies to the eastern part of the Zíra Tahsíl where the rainfall is heaviest. The rates diminish with the rainfall, and in the south-west of Ferozepore the highest rate is only 14.52 annas per acre. The rates on second and third class crops are every where, respectively, 14.52 and 9.68 annas per acre. There is a low rate of 10.89 pic per acre on grazing land. These rates are in most cases rather higher than I originally proposed. I was influenced by the poverty of most of the riverside communities and by the many inconveniences which they have to bear. The rates now sanctioned are not too high if fairly applied. They have been sanctioned until the time when the Muktsar Tahsíl comes under re-settlement, when a further report will be made on the working of the system. This will be in 1891. At present only one year's results are available, those for 1889 not being yet ready. Some complaints are made of the effect of the orders of Government contained in paragraph 6 of Junior Secretary's No. 181 of 8th September 1888 reviewing the Zíra Assessment Report, by which canal rates are charged on lands which are partially flooded by the river.

19. Excepting the case of the canal-advantage ratio the term of Settlement has every where been fixed at 30 years, and therefore Term of Settlement. it will expire with the rabi season of the year 1916-17 in Moga, and with the rabi season of the year 1917-18 in Zíra and Ferozepore.

20. The cesses were left as they were before with the addition of 8 Cesses. annas per cent. to the local rate on account of District Post. They thus stood as follows:—

		Lambardár Rs. 5 0 0	Rs. a. p.
Village officers	... {	Patwári „ 4 11 0 }	9 11 0
Local rate	... ...	... ... ... ...	10 13 4
		Total	20 8 4

But a change has now been introduced by *Punjab Gazette* Notification No. 208 of 9th September 1889, by which the local rate is reduced to Rs. 10-6-8.

21. At the Regular Settlement Rs. 65,599, or 14 per cent. of the revenue, Revenue assigned and released. By the time the present revision commenced the amount had sunk to Rs. 50 577, or 11 per cent. of the current demand. Some of the existing grants expired with the term of Settlement. Others would have expired, but their continuance has been recommended for the lives of present holders, persons of advanced age. A limited number of grants, which at Regular Settlement were sanctioned only for the life of the incumbents, were really attached to institutions deserving of encouragement, and extensions for the term of the new Settlement have been recommended. A very few entirely new grants have been proposed in favor of institutions for the public convenience, which the land-holders have endowed with lands since the term of the Regular Settlement.

The revenue of one whole assessment circle, *viz.*, Mahráj, is without exception assigned. The villages constituting this circle are partly owned by descendants of the family from which the Phulkíán Rájás derive their origin, and partly by *Bháís* connected with the late Kaithal family. They came under our Government voluntarily at an earlier time than the Sutlej Campaign and have always held their lands free of revenue. Government has surrendered the right of lapse except in the case of villages held by the Bhái of Arnauli. Setting aside this exceptional tract by no means a large amount of the revenue of these tahsíls is in other hands than Government's. The principal jágírs are those of the Sodhís of Buttar, and of two Sardárs of the family of Tára Singh Gheba.

22. Zaildárs had been provisionally appointed in the Moga and Ferozepore Tahsils by Colonel Grey, Deputy Commissioner, in 1882, Zaildári arrangements. but not in Zíra. The appointments were made by election. On the subject being now formally reported, Government ordered the men already appointed to be confirmed unless there were grounds against any of them, which would have justified the cancellation of the elections or the dismissal of the Zaildár. Accordingly all were confirmed, though one or two of their circles were modified. In Zíra a new set of appointments was made by nomination, not by election. These have been sanctioned by Government. The Zaildárs will receive the same rate (one per cent.) on the fluctuating canal assessments of their circles as on the fixed demand.

23. The revenue was distributed in the majority of cases in the same manner as it was assessed by an uniform rate on all cultivated land. In the Dogar and Naipál villages on the river-side and in a few other cases a distribution upon shares was preferred. But nearly 100 villages which had hitherto been paying by shares have now elected to pay upon areas, thus changing the constitution of their villages from *patti-dári* to *bhaiachára*. This change is indicative of agricultural progress. In some cases in the uplands where it happened that certain sharers had reserved a portion of their lands for grazing, it was not considered fair by the other

sharers that such reserved lands should be held revenue free, for it was argued that they would probably soon be brought into cultivation. The dispute was generally adjusted by putting half rates upon the waste land and lightening *pro tanto* the rates on cultivation. But the waste areas in the uplands were so small that the practical effect to the owners of cultivated land was inappreciable. In a few cases, at the request of the owners, land lately fallen out of cultivation was rated in the distribution as if it were cultivated. The well assessments are all fixed on shares corresponding to the turns which the sharers take in using the well. If there are two or more pulleys or wheels the whole assessment is first divided by the number of pulleys or wheels, and afterwards by the number of turns taken at each by individual owners. The canal rates are paid according to the actual areas on which they are assessed, and so are the alluvial assessments, but in some cases the owners have been allowed to pay alluvial assessments according to shares.

24. There were a few irregular petitions of objections presented by villagers of the Moga Tahsil, and in one case an appeal was made to the Commissioner, but it was dismissed. The appellants were the richest landowners in the tahsil. In the other tahsils there were no objections. Notwithstanding the magnitude of the enhancement, which is 56 per cent. on the whole tract under Settlement, the people always express themselves as very well satisfied with what has been done. Owing to the assessments having been made in a manner adapted to the comprehension of the people hardly any objections occurred about the distribution over individual holdings.

Future revenue management. 25. In reporting the detailed village assessments of the Moga Tahsil I made the following observations:—

"The rates are so light as compared with the value of the owner's rent share that, except in the most exceptionally bad years, there can be no difficulty whatever in paying the revenue now assessed, and it will, in my opinion, be far better to wait until such emergencies occur, and then, if necessary, to make liberal suspensions or remissions rather than to reduce the pitch of the assessment now. The loss of a single kharif crop will cause the agriculturists in this tahsil very little inconvenience and no loss if the following rabi season is fair. If the rabi also fails there may be some pressure in places, and should the next rainy season open badly some villages may have some difficulty in obtaining money. Under these circumstances the rabi instalment might be allowed to stand over until the prospects of the coming rainy season disclose themselves, and, if the result is unfavorable, the greater part might be remitted. But if there be reasonably good rains, then the loss of even two preceding crops would not be felt as very serious, and some partial suspensions would be all that would be needed. Such a succession of bad seasons as to require remissions of revenue are not likely to occur more than once or twice in the term of Settlement."

These views were approved by the Financial Commissioner. They will apply equal to the lower Rohi in Zira and Ferozepore. In the Bet, however, the soil is not so well able to withstand the effects of drought, nor have the people sufficient stamina and resources to carry them through a long period of distress.

Any villages in the western part of the Zira Bet or anywhere in the Ferozepore Bet which are dependent to any considerable extent on dry cultivation will, I think, always require watching, and those which are canal watered will need still more careful treatment if by any mischance the canal irrigation should at any time fail. I doubt whether it will be wise in the poorer class of villages to allow the revenue demand in any year to exceed an incidence of Rs. 2 per acre on the crops actually harvested within the year. Except in the eastern part of Zira there are not so many wells as there ought to be in the Bet, and the construction of new ones should be encouraged by taccavi loans. An advance for the purchase of bullocks should, I think, usually accompany the loan for the making of the well if the borrower desires it.

26. The record of rights has been prepared in accordance with the Form of record of new Land Revenue Act, XVII of 1887. The main part of rights. the record is—

(1). A *jamabandi* (section 31 (2) (a) of the Act). This is what is described in the Patwari and Kánuñgo Rules, para. 61, as a detailed

jamabandi. It was prepared in the year in which the assessments of the village were completed. In the great majority of cases this year was 1887-88, but some villages were finished in 1886-87. In 1887-88 the new assessments were in force in Moga and Mahráj, but not in Zíra and Ferozepore. None of the Zíra and Ferozepore jamabandís contain revenue entries according to the new assessments, but the new jama has been subsequently added in red ink for the whole village and for each main subdivision of it. In Moga, on the other hand, there are many villages in which the new assessments were introduced before the measurements were completed. The distribution of the kharíf instalment of 1887 was made upon the basis of the old areas. But the measurements were in nearly all cases completed before the time for the payment of the rabi instalment of 1888, and so the distribution was amended in time. In the few villages which remained unfinished in June 1888 the preparation of the jamabandi was deferred until the measurements were completed, and the revenue was then entered according to the new distribution.

(2). *The field map.*—This is on sheets 20 inches square, each comprising 16 five-inch squares. The sheets are lettered longitudinally from the right and numbered vertically downwards. An index map accompanies the sheets of each village. The scale of the maps is almost invariably 200 feet to one inch, but in a few cases where the fields were very small a scale of 100 feet to the inch has been substituted. The sheets were backed with cloth before they were drawn upon. It is believed that the maps at this Settlement will be found fairly true to scale. I have very seldom, except quite at the commencement of the work, found an error of more than $\frac{1}{16}$ th of an inch in the plotting, and the Extra Assistant Settlement Officer's experience in his inspections has been the same. The sheets have sometimes got a little stained or crumpled by being in hand for so many months in various weathers, but, on the whole, it is wonderful how the patwáris have kept their maps so clean. The colouring, which was done by the patwáris themselves, is occasionally somewhat rough. It is very difficult to put a smooth tint of pale colour on a surface which has been much handled. It would be well to reduce the quantity of colouring work which a patwári is required to do. I have taken a step in this direction in the draft rules for preparation of alluvion and diluvion papers. The comparison of distances between boundary pillars as deduced from the Survey Department's data on the one hand, and the patwári's square work data on the other, was carried on by arithmetical methods for a long time before the patwáris maps were complete. The results obtained up to the end of 1886 were tabulated, with the result that in 80 per cent. of the comparisons made there was no greater discrepancy than 5 links of the Gunter's chain, equal to less than $\frac{1}{16}$ th of an inch on the patwári's map. The average difference on the whole series was about 1 part in 1,500. The distances compared were 2,800 in number and aggregated about 2,300 miles in length. But there were a good many cases found in which the distance deduced from the square work could not be made to agree with the Survey Department's distance. In these cases resort was had to a careful measurement of the distance in a straight line from pillar to pillar, and the result of this was generally in accordance with our own calculation rather than with that of the Survey Department. Several lists of such cases were sent to the Survey Department for examination, and it was ascertained that some errors had occurred in that Department in altering distances so as to make the circuits close, and also that in running out traverse lines to lengths of 10 or 12 miles

without intermediate check some of the intermediate stations are apt to get appreciably misplaced. It would seem that when a professional survey is to be used as a test of the correctness of Settlement maps made on the square system, it will be worth while to make it rigidly accurate, and in particular to take care that good angular work is not spoiled by uncertain chaining.

(3). *The genealogical table.*—This has been already described in para. 9. It is placed with the *jamabandi*. Such field registers (*khasrás*) as had been made before the order for the abolition of this part of the record was received have been filed. The field books have not been filed. The holding slips (*khataunis*) are not part of the record, and will be kept for only 12 years.

(4). *The statement of village customs*, formerly called the *wájibularz*. This is bound with the *jamabandi*. The form of this statement has been simplified under the new Act by the omission of matters which are otherwise provided for, and in this district it generally forms a very brief document. No attempt has been made to record rights or shares in canal water whether on the Sirhind Canal or on the district inundation canals. The whole matter is left within the control of the officers of the Canal Department and of the Extra Assistant Commissioner in charge of the district canals.

In accordance with the orders of the Financial Commissioner, the land occupied by beds of the inundation canals has been recorded as still owned by the former proprietors, but as occupied by the canal management.

(5). With the *jamabandi* also have been bound, for convenience sake, the order passed under section 51 of the Land Revenue Act announcing the assessment and the list of village cesses recorded under section 145. I was anxious to lay down by consent of the villagers a simple rule for prolonging village boundaries into lands gained from the river. The rule would be that, so far as any map previously made by revenue authorities will go, the boundary should be laid down according to such map, and that from the last point of the map a normal should be drawn to the *general course* of the river, neglecting local bends in the channel. But this rule cannot be pronounced to be quite free from exception, and I have not embodied it in the maps which form part of the record. It would have been better if the square work of all the river villages had had a common base, but this was not thought of in time. In the new Settlement of Mamdot a common base 36 miles in length has been laid down for the whole *jágír*, and a parallel base, distant from the first by an integral number of squares, has been laid down in the Lahore District. Any point shown in a Mamdot village map will be directly referable to any other point shown in a map of any of the opposite Lahore villages, which is a great desideratum in river boundary disputes.

27. A code of tribal customs has been drawn up which will be separately printed. There is so little difference to be found, in

Tribal customs.

the main topics of rural customs, between one tribe and

another, even between Hindu and Muhammadan tribes, that it was possible to combine all the tribal codes into one English abstract. All the tribes strongly insisted on the principle that landed property should not go out of the tribe and section to which it belongs ; they consequently denied the right of females, or persons related through females, to inherit land, and also declared for very limited powers of alienating such property. No code of riverside customs was prepared, this subject having been disposed of in the previous Settlements of the Jullundur District in 1883 and of the Lahore district in 1869.

28. Appendix No. III shows the number of civil and revenue cases, Settlement business original and appellate, disposed of by the Settlement returns. staff.

No less than 260,000 mutations were made in the record of rights during the course of Settlement operations; a large number of these being, as noticed in para. 4, the arrears of previous years. The number of partitions disposed of by regular proceedings, in addition to the numerous cases of this kind which were dealt with as mutations, was 2,022.

After the conclusion of the assessments the proprietors naturally raised the question of the enhancement of rents paid by their tenants having rights of occupancy. The great majority of such tenants, especially in the Moga Tahsíl, had, under the previous Settlement, been paying merely the Government demand and cesses without any addition for the benefit of the owner. This state of things evidently could not survive the revision of the assessment. The landlords desired that the Settlement Officer should make an equitable award in each village for each class of tenants, fixing the rate or amount of rent to be paid for the new term of Settlement. It was determined, however, after some demi-official correspondence that rents could not be validly fixed by any other process than a regular suit and decree. Accordingly the suits of the landlords were taken up village by village by myself and the Extra Assistant Settlement Officer who was specially empowered to try such cases, and regular decisions were passed. The number of such cases appears on the returns as only 376, but each suit included, as a rule, the owners and the tenants of a whole village, and the number of individual tenancies in which enhancements were thus decreed was quite 5,000. The rate of enhancement allowed seldom exceeded two annas on the rupee of the Government assessment. The owners were satisfied with these enhancements, but many of the tenants thought that they ought as before to pay no rent at all.

29. The cost of the whole Settlement operations is shown in Appendix No. IV. The additional revenue which had actually come in by the time that operations were concluded almost covered the expenditure incurred by Government, the latter sum being only about 17 per cent. in excess of the amount of the enhancement for a single year.

NOTICE OF OFFICERS.

30. I was fortunate in having almost from the commencement of operations up to their conclusion the assistance of so thoroughly good an officer as Munshi Nathu Rám, Extra Assistant Settlement Officer. Nathu Rám has a most perfect knowledge of the subject of the revenue records in all its branches and a wide knowledge of the people and their needs. He is indefatigable at his work, and has a shrewd eye for all the faults which patwáris and other Settlement subordinates are likely to fall into. His inspection work is therefore unusually valuable. The advice he gave me in questions connected with the control of the establishment was, I consider, sound and impartial. I consulted him formally or informally in almost all important matters, and hardly ever without advantage. He is, in my opinion, an exceptionally valuable servant of Government.

SUPERINTENDENTS.

Of my Superintendents Pandit Shankar Das, Superintendent of Zíra, who is now officiating as Extra Assistant Settlement Officer in the commencing re-settlement of Muktsar and Mamdot, was on the whole the best. He is pains-taking, careful and thorough, and maintained a very good system of control in his tahsíl. Lála Devi Sahái, Superintendent of Moga, displayed energy and good judgment. From both Shankar Dás and Devi Sahái I received much help in assessment work, as they had made themselves intimately acquainted with the state of the people. Munshi Muhammad Afzal Khan, who during the latter part of the operations was Superintendent of Ferozepore, was far the best educated and most intelligent of the Superintendents, but he spoiled his work by want of sufficient application to details. He unfortunately chose to consider the Extra Assistant Settlement Officer as personally hostile to him and fancied that his Hindu subordinates were working against him. I had much trouble to get the record of this tahsíl brought into a correct state.

DEPUTY SUPERINTENDENTS.

The best of the Deputy Superintendents was Ganga Rám, since promoted to Settlement Tahsídár in Lahore. Some men in this grade were quite worthless. Wazír Singh, Head Clerk of my office, was sent into the field as a Deputy Superintendent, and has subsequently been promoted to Settlement Tahsídár.

The Tahsídárs and Náib-Tahsídárs of the district staff were each given charge of limited circles with a view to their participating in Settlement business, but with the exception of Tára Singh, Tahsídár of Moga, they did not generally find time to take up Settlement work with much good effect. Fateh Singh, Tahsídár of Ferozepore, assisted in the assessment of the villages of his circle.

31. I subjoin a few general statistics for the whole tract which has been under Settlement, as it may be useful to have them available in this report. Further details of every kind are of course to be found in the Assessment Reports and in the Gazetteer. The figures given are according to the agricultural returns of the year 1887-88 in which the Settlement was completed.

The total area of the tract is 1,042,963 acres, of which 65,519 acres, or 6 per cent., are unculturable; 76,181 acres, or 7 per cent., are culturable waste; and 901,109 acres, or 87 per cent., are cultivated. Of this last amount, 7 per cent. are irrigated by wells, 11 per cent. by canals (6 per cent. by the Sirhind Canal and 5 per cent. by district inundation canals), between 1 and 2 per cent. are flooded by the river and over 80 per cent. are dry. There are 3,759 bricked and 174 unbricked wells in use. The following are the proportions of the cultivated area occupied by each kind of crop:—

Kharif crops.			Rabi crops.		
Rice	...	½ per cent.	Wheat	...	31 per cent.
Maize	...	4 "	Barley	...	9 "
Jowár	...	16 "	Gram	...	27 "
Bájra	...	1 "	Rape	...	3 "
Pulses	...	6 "	Tobacco	...	½ "
Cotton	...	½ "	Others	...	1½ "
Others	...	1 "	Total	...	72 "
Total	...	28 "			

The population is 507,793.

The incidence of the new revenue is about 12 annas per acre on the gross area and about 13½ annas per cultivated acre. The number of proprietors is 75,459. Each has on the average about 13 acres of land. The average area cultivated by a single plough is about 18 acres. The proprietors themselves occupy 67 per cent. of the cultivated land; tenants with rights of occupancy, who generally pay only a small percentage over the Government revenue, hold 14 per cent., and tenants-at-will hold 19 per cent. Three-fourths of the latter pay rent by division of the crop at rates varying from one-fourth to one-half of the produce.

The rates of cash rents, where such rents are paid, vary from Re. 1-3-0 to Rs. 5 per acre.

About 12 per cent. of the whole area is under usufructuary mortgage, but the mortgagees are very generally peasants themselves. Land sells at from Rs. 30 to Rs. 80 per acre.

APPENDIX No. I.

List of Government Notifications issued regarding the Ferozepore Settlement.

No.	Date.	Department.	Abstract.
275	1st Decr. 1884 ...	Revenue and Agriculture.	Sanction of Government of India for the settlement of Ferozepore, Moga and Zira Tahsil, with the names of officers to conduct the same under Section 11 of Act XXXIII of 1871.
276	Ditto ...	Ditto ...	Investment of Revenue powers to the above officers under Section 3 of Act XIV of 1875.
277	Ditto ...	Ditto ...	Mr. E. B. Francis invested with the powers of a Deputy Commissioner with regard to the appointment, punishment, and removal of Patwáris and Kánungos.
278	Ditto ...	Ditto ...	Mr. E. B. Francis invested with the powers of a Magistrate of the 1st Class under Section 36 of the Civil Procedure Code and under Section 191, clauses (a), (b) and (c), and Section 26 of the same Code.
279	Ditto ...	Ditto ...	Munshi Nathu Rám invested with the powers of a Second Class Magistrate as above specified.
281	Ditto ...	Ditto ...	Tahsils of Moga, Zira and Ferozepore declared to be under Settlement, or that a Settlement is proceeding in them.
282	Ditto ...	Ditto ...	Mr. E. B. Francis, Settlement Officer, invested with the powers of a Deputy Commissioner to try suits under all clauses of 1st group, Section 45, and clauses (l) and (m) of 2nd group; and under Sections 56 to 61 of the same Act.
283	Ditto ...	Ditto ...	Mr. E. B. Francis invested with appellate powers of a Commissioner under Chapter IV of the said Act.
284	Ditto ...	Ditto ...	Assistant Settlement Officer and Extra Assistant Settlement Officer invested with the powers of a Deputy Commissioner as specified in Notification No. 282.
285	Ditto ...	Ditto ...	Settlement Superintendents invested with powers under Section 46 (1) of the said Act.
286	Ditto ...	Ditto ...	Assistant Settlement Officer, Extra Assistant Settlement Officer, and Settlement Superintendents' jurisdiction as Revenue Courts under Chapter V of the said Act.
297	23rd Decr. 1884.	Ditto ...	Mr. E. B. Francis, Assistant Commissioner, appointed as Assistant Settlement Officer of the Ferozepore District, with effect from 3rd November 1884.
1058 S.	30th August 1885.	Ditto ...	Shekh Allahditta, Deputy Superintendent of Settlement, invested with the powers of a Tahsildár under Act XXXIII of 1871 under the provision of Section 3, Act XIV of 1875, for the time he officiates as Settlement Superintendent.
660	18th Septr. 1886.	Ditto ...	Mr. Isa Charn Chandu Lál, Probationary Extra Assistant Commissioner, invested with powers as specified in Notification No. 1058 S.

List of Notifications—concluded.

No.	Date.	Department.	Abstract.
732 (Genl.)	1st Novr. 1887...	Revenue a n d Agriculture.	Mr. E. B. François and Munshi Nathu Rám invested with the powers of Assistant Collector, 1st grade.
733 (Genl.)	Ditto ...	Ditto ...	Mr. E. B. Francis invested with special powers under section 77 (4) (b) of the Punjab Tenancy Act of 1887.
734 (Genl.)	Ditto ...	Ditto ...	Mr. E. B. Francis, Settlement Officer, invested with the powers of Collector under Section 105 (1) of the said Act.
735	Ditto ...	Ditto ...	Mr. E. B. Francis invested with all the powers of Collector under the said Act, except Chapter VI, and under Section 27 (1) and (2) of the Punjab Land Revenue Act of 1887.
529	11th Septr. 1888.	Ditto ...	Lala Kesho Dás, Probationa Extra Assistant Commissioner, invested with the powers of Assistant Collector, 2nd Grade.
713	19th Dece. 1888.	Ditto ...	Ralla Rám, Deputy Superintendent, invested with the powers of Assistant Collector, 2nd Grade.



Satyameva Jayate

APPENDIX No. II.

Statement showing the progress of measurement work made in the Ferozepore District.

YEAR.	FEROZEPORE.	Moga.	ZIRA.	Total.	Villages completed.	
					Area measured in Ghumaos.	Area measured in Ghumaos.
1885	...	249	9,546	34,790	22	172
1886	29,480	108,534	40	...
1887	24,361	89,472	73	...
1888	45,288	170,398	114	...
Grand Total	...	249	108,675	403,194	249	172
					361	244,964
					172	361
						361
						282
						618,009
						1,298,204
						782

APPENDIX No. III.

General Statement of Revenue and Judicial business performed by each grade of Officers of the Ferozepore Settlement from 1884-85 to 31st March 1889.

NAMES OF OFFICERS.		REMARKS.					
Revenue Court cases decided.	Settlement Officer	165	2,953	3,118	12	543	126
Revenue Officer's cases decided.	Extra Assistant Settlement Officer	1,019	1,757	38	2,814	50	...
Revenue Executive cases decided.	Settlement Tahsildars and Officiating Tahsildars	1,478	4,784	45	6,307	...	...
Other cases.		...	...	...	...	...	...
Total cases decided.							
Criminal cases decided.							
Revenue judicial appeals.							
Revenue executive appeals.							
Total ...	2,662	9,494	83	12,239	62	543	126

APPENDIX No. IV.

Statement showing the Expenditure of the Ferozepore Settlement from 1884-85 to 31st March 1889.

Major head of Service.	Minor head of Service.	Amount.		
		Rs.	A.	P.
	Salary and Settlement Allowance to Gazetted Officers	84,495	3	9
	Travelling Allowance of Settlement to ditto	9,170	11	0
	A. Settlement Tahsídárs	23,896	12	7
	B. Office Establishment of Assistant Settlement Officer ...	99	13	4
	C. Subordinate permanent Establishment of Settlement			
	(I) Office Establishment on fixed pay	5,673	11	1
	(II) Office Kánungos	25,022	8	11
	(III) Deputy Superintendents	34,270	8	4
	(IV) Field Kánungos	43,572	0	2
	(V) Menial Establishment	4,261	14	1
	D. Temporary Establishment	46,639	2	8
	Total Establishment ...	1,83,436	7	2
	(1). Travelling Allowance of Establishment	6,567	3	3
	(2). Hot and cold weather Charges	617	12	7
	(3). Tour Charges and Pay of Khalásí	6,721	5	7
	(4). Purchase and repair of Tents	902	7	9
	(5). Survey Equipment	3,423	6	9
	(6). Hutting	152	6	0
	(7). Other Items	6,160	15	2
	Total Contingencies ...	24,545	9	1
	Total Land Revenue and Settlement Charges ...	3,01,647	15	0
LAW AND JUSTICE.	Process-serving Establishment	5,627	0	1
STATIONERY AND PRINTING.	Country Stationery and carriage of Stationery Boxes ...	12,689	15	8
	Lithography	2,645	10	7
	Total Stationery and Printing ...	15,335	10	3
	Office Rent	2,803	0	4
	GRAND TOTAL Rs. ...	3,25,413	9	8

APPENDIX No. V.

Rules for the Annual Assessment of Revenue due on account of Irrigation from the District Inundation Canals in the Ferozepore District.

1. Canal revenue is charged upon lands irrigated from the inundation canals which produce a kharif crop, or which are watered for the ensuing rabi crop.

2. At the time of the kharif girdawari, the Patwari, in addition to writing the word "nahri" against all crops irrigated from the canals, will write the words "taraddadi nahri" against any cultivated land which has received canal water and has not been sown with a kharif crop, but may produce a rabi crop. Land in depressions which is still submerged at the time of the kharif girdawari will usually not be fit to be sown with a rabi crop, and should, therefore, ordinarily, not be entered as "taraddadi nahri." No entry will be made on account of kharif crops, which have failed, or on account of land benefited by percolation, or for any uncultivated land, unless any landholder has taken water by application purposely for growing grass, in which case, though the canal revenue may not be charged, yet the establishment or *bachh* rate will be charged.

3. The field Kánuñgo, the Tahsildár, and the Náib-Tahsildár will devote special attention to the supervision of the girdawari entries regarding canal irrigation; every canal irrigated village should be seen by the Tahsildár or Náib-Tahsildár during the girdawari. The Miráb should accompany and assist the Patwari. The canal Dárogha may inspect the girdawari. The Dárogha and the Miráb should bring to the notice of the field Kánuñgo, or his superior officers, any case where the Patwari is omitting to record irrigation; but the Dárogha will not give orders to the Patwari direct. If the fact of water having been received is disputed by the landholder the Patwari will add the word "tanáza" to the crop entry.

4. After completing the girdawari, and sending in his crop abstract, the Patwari will prepare for each village an abstract according to jamabandi holdings of the lands irrigated. The holdings of occupancy tenants who pay rent in cash at rates based upon the Government revenue, and of part owners of a joint holding who pay the revenue of that holding according to the areas of their separate cultivation therein, will be shown separately.

5. The total for each holding will be divided into two heads—(1) superior crops (*ajnás-i-ala*) and (2) others (*ajnás-i-digar*). If part of the irrigation was by lift (*Jhállár* or *Jhatta*) a further detail will be given of flow and lift. Maize, rice, sugar-cane, cotton, and chillies are reckoned as superior crops. The areas of canal crops which failed, and areas of which the irrigation is disputed (*tanáza*), will be added below the totals. The totals will be given in whole kanals, a quarter kanal being neglected and a half kanal being reckoned as a whole kanal.

6. The rates of canal revenue are one-and-a-half anna per kanal (12 annas per ghumáo) for superior crops, and three-quarters of an anna per kanal (6 annas per ghumáo) for others. Irrigation by lift will be charged at half rates. The sum due at these rates will be stated under the total of each holding in the same detail as the areas, and the amount of cesses will be added.

7. The Patwari will give, for information, to the person or one of the persons responsible for the revenue of each holding the rough slip upon which he has abstracted the fields of that holding.

8. He will make a total for each village in the same detail as above, and forward it through the field Kánuñgo to the Tahsildár by the 15th of November. The office Kánuñgo will make a list for the Tahsil village by village with totals, and the Tahsildár will forward it to the Extra Assistant Commissioner in charge of the canals.

9. The Tahsildár or Náib-Tahsildár will then proceed to announce to the headmen of each village, at some place within the Patwari's circle to which the village belongs, the sums which are due from their village according to the statements made out by the Patwáris. He will receive any further objections which may be made orally or in writing. He will visit each field in which there is a disputed entry, and will report briefly thereon (in the form of a list of fields for each village) for the orders of the Extra Assistant Commissioner. If the amount in question in any village exceeds Rs. 10, the Tahsildár or Náib-Tahsildár will take with him as assessors (1) the Miráb; (2) the Záildár, or if the Záildár is unable to attend, or is himself the Miráb, then any *Safedposh* of the same Zail; and (3) any Lambardárs of the neighbourhood not being personally interested, who may be chosen by the objector, and he will report their opinions as well as his own. The Deputy Commissioner may authorize the canal Tahsildár to exercise the same functions in regard to the disposal of disputed entries as a Tahsildár or Náib-Tahsildár. If the amount in question exceeds Rs. 25, the Extra Assistant Commissioner will himself enquire into it on the spot.

10. If the Extra Assistant Commissioner himself, or on the report of the Tahsildár or Náib-Tahsildár or canal Náib-Tahsildár, with or without assessors as above, according to the amount involved, finds that any kharif crops have wrongly been entered as "failed," he may add the proper charge, and he may also make any other corrections which are required. All orders must define field by field the areas which are charged or exempted. The Extra Assistant Commissioner will communicate his orders to the Tahsildár, who will correct the village totals furnished by the Patwári, and will direct the Patwári to correct his list of holdings accordingly, and to make similar corrections upon the slips given to the revenue payers.

11. The Extra Assistant Commissioner, after disposing, if possible, of all objections, will by the 15th of December forward the list of demand to the Deputy Commissioner, and will report at the same time what progress has been made in the disposal of objections. The Deputy Commissioner will then issue orders to the Tahsildár to collect the canal revenue as shown in the amended village statements. Charges which are in dispute will not be collected until the dispute is decided.

12. The canal revenue will be collected in the same proportions for the kharif and rabi seasons as are fixed for the land revenue of the village. It will be paid along with the cesses due upon it with the second instalment of each season.

13. Where the fixed land revenue of any land is assigned or shared between Government and assignees the canal revenue chargeable on the same land will also be assigned or shared as the case may be; provided that in the case of revenue free assignments granted subsequently to the date of the introduction of the new assessments, the canal revenue will be entirely khálsa. The canal revenue on land included in the Mamdot jágir is shared between Government and the Jágírdár in the proportion of two-thirds and one-third respectively.

14. Refunds of any sums wrongly collected on account of canal revenue may be made by the authority of the Deputy Commissioner in the form of a deduction from the demand on the same village for the next season. The field Kánango will be responsible that in the next báchh the refund is credited to the proper person.

15. If at the time of rabi girdáwari the Patwári finds that a rabi crop has been grown in land which, being submerged at the time of the kharif girdáwari, was not recorded as "taraddudi nahri," he will report the fact to the Tahsildár, who, after informing the landholder, will order the area in question to be added to the next year's demand statement, or, if there is a dispute, will proceed as above directed in the case of disputes. In areas so added at the time of the rabi girdáwari, only so much as has successfully grown a crop will be included. If, uncultivated land which was irrigated in the kharif season be brought under cultivation and grow a crop in the rabi season, it will be dealt with in the same way. If, on the other hand, land which, though charged as "taraddudi nahri," remained too wet to be sown with a rabi crop, the sum charged on it may, under the orders of the Extra Assistant Commissioner, be deducted from the demand of the rabi season.

16. In the month of April, when the demand for the year has been finally determined, the Deputy Commissioner will report the amount, with details, to the Commissioner of the Division, and will submit a bill for the amount due as Zaildárs' fees at the rate of one per cent. on the demand for each Zail. This bill, on being countersigned by the Commissioner, will be payable in the form of a deduction from the next rabi instalment of the canal revenue of the Tahsíl.

17. Collections on account of canal revenue will be entered in the Tahsíl and Treasury accounts as fluctuating land revenue.

(Sd.) E. B. FRANCIS,
Settlement Officer.

APPENDIX No. VI.

Copy of a letter, No. 133, dated 17th April 1889, from E. B. FRANCIS, Esquire, Settlement Officer, Ferozepore, to Colonel G. GORDON YOUNG, Commissioner and Superintendent, Jullundur Division.

I HAVE the honour to submit herewith a draft of a set of rules for the annual assessment of lands subject to river action in that part of this district which is at present under settlement.

2. The rules embody those modifications of the Jullundur and Hoshiarpur rules to which we have been led by the circumstances of our riverside cultivation, and which have been sanctioned in principle by Government in the orders passed upon the Zira and Ferozepore assessment reports. The most important of these modifications are :—

- (1) that land which, after having been cultivated and assessed, remains out of cultivation for two whole years, and so ceases to be classed as cultivated land, shall no longer be made to pay revenue as if it were cultivated; and
- (2) that the successful cultivation of a superior crop, and not merely the fact of a superior crop having been sown, is made the criterion of the land having become fit to bear a higher rate of assessment.

Under the Jullundur and Hoshiarpur rules, if land be once sown with wheat, then, though the crop may have been a total failure, it will be assessed at the high rate appropriate to wheat; and though it may never again be cultivated at all, yet, if no further river action takes place, it will go on year after year paying the same rate. Rules of such rigidity would be decidedly unsuitable to this district. Large areas of newly-formed land are sown at random in order to see where the soil is deep enough to be fit for cultivation; and where the first experiment results in a distinct failure, the land is frequently abandoned and another place is tried. I have provided that, where one of the superior kinds of crop is sown, but the produce is bad, it may be assessed one grade lower in the scale,—that is to say, bad wheat may be charged at the rate of barley, and bad barley at the rate of masor. This proviso only applies to newly-cultivated land, or to land of which the revenue would be raised by the application of the higher rate. It does not permit land which has once grown a good crop of any grade to be charged at a lower rate in a subsequent year on account of a subsequent crop being inferior or of a lower kind. The only case in which, independent of subsequent river action, I propose to allow the assessment of a field to be lowered is when it falls altogether out of cultivation, or when it is put outside the operation of the rules as having ceased to be flooded land. Crops of the lowest kind can be charged at no lower rate, however unsuccessful they may be. It is hoped that the rate fixed by Government for crops of this grade, though a little higher than I myself proposed, will not be found high enough to cause any great degree of hardship even if there is sometimes a large proportion of failed crops. These rules, though in some respects more elastic than those framed for the Hoshiarpur and Jullundur districts, do not aim at introducing anything that can be called a fluctuating system of assessment, but, on the contrary, have for their object the establishment of a suitable fixed assessment at as early a period as the circumstances of the land will permit.

3. In the rules relating to procedure, the principles of the Hoshiarpur and Jullundur rules have been adapted to the square system of mapping. I have simplified some parts of the procedure and some of the tabular forms, without, I believe, sacrificing anything essential. Most of these simplifications have been already brought into practice in this settlement. I have not proposed to deal in the rules with the subject of village boundaries. The usual custom and practice in this district in case of new land being formed in front of two or more villages is for the limits of each village to be set out according to the maps of the regular settlement of 1853, so far as that map extends, and beyond that point to set out the boundaries in parallel lines perpendicular to the general course of the river. But in particular cases a somewhat different rule may have been established by judicial decision. I am preparing a general map of the riverside villages, showing the lines of the square system of each. This will render it very easy to lay out the required perpendiculars with reference to the square lines of each village map. I have added a means, which I have in practice found to be wanted, of verifying the fact of any particular field having been already fully assessed. I have not required any colouring of maps, as it is difficult for a Patwari to do colouring properly while he is engaged on the riverside. A translation of the rules is attached.

Alluvion and Diluvion Rules for Zira and Ferozepore Tahsils, Ferozepore District.

APPLICATION OF RULES.

These rules apply to land which is ordinarily affected by the river floods. Where part only of a village is under the rules, the limits of that part have been marked on the

map by a line. Land situated above that line is under fixed assessment, which will not be changed during the period of settlement on account of any changes in the cultivation until a reduction of the assessment be required on account of action of the river.

2. It is not intended that the limits above referred to shall be lightly changed; but if the Deputy Commissioner, upon the petition of the owners of any village, be satisfied that any considerable block of land has ceased to be benefited by inundation, he may order it to be removed from the application of the rules, and give it a fixed assessment at the dry rates stated hereafter. The limits of such block of land will be marked on the girdawari map, and a reference to the Deputy Commissioner's order will be given. Should such land afterwards regain the advantage of river inundation it may by the same authority be again brought under the rules. Where reduction of assessment of land under fixed assessment is required by river action the land will be brought under these rules.

3. The following is the schedule of crop rates to be used in making assessments:—

No.	Kind of crops.	Rate per kanál.		Rate per acre.
		As.	As.	
I	All crops not named below—			
	(a) In Zíra Tahsil down to Khiyáli	2	16	19.36
	(b) In Zíra Tahsil below Khiyáli and Ferozepore down to Palla Megha.	1 $\frac{1}{2}$	14	16.94
	(c) In Ferozepore below Palla Megha	1 $\frac{1}{2}$	12	14.52
	Jouár and chari, moth móng, kharsutice, til.			
II	Barley, gram, rape, tárámíra, linseed, melons ...	1 $\frac{1}{2}$	12	14.52
III	Másh, másar, churral, ajwain, methi, senji ...	1	8	9.68
IV	Grazing land	1 $\frac{1}{2}$ pie	9 pies	10.89 pies

The báráni rate in Tahsil Zíra is 10 annas on all cultivated land, and in Tahsil Ferozepore 9 annas, nothing being charged on uncultivated land.

4. The rate charged will be that for the highest class of crop which the land has shown itself capable of successfully producing. Thus, whenever land successfully produces a crop of a class chargeable at a higher rate than the rate before assessed on that land, the rate will be raised accordingly. But no reduction of assessment will be allowed on the ground of a crop of the lower class being grown in a subsequent year, unless it be proved that the land has since been injured by the action of the river, as, for instance, where the soil has been left too thin by the erosion of its upper surface or has been covered by a deposit of sand.

5. Where a crop chargeable at a higher rate than that hitherto paid is sown, but the yield is very poor, the land will be charged as if a crop of the next lower class had been successfully grown. When the crop is very bad for more than two years it should be considered whether the soil has not been lowered in quality by the action of the floods.

6. When land previously under fixed assessment is brought under the rules the appropriate crop rates will be applied to all cultivated land and grazing land without reference to the previous assessment.

7. The classification of land should not be too minute. If different parts of a survey number grow different crops, or if two or more crops are mixed, the whole area under crop should be charged according to the crop which occupies the largest area or which constitutes the largest part of the mixture. There should not be two different crop rates in the same number.

8. In reckoning the revenue no fractions of a kanál will be regarded. Any fraction under a half kanál will be neglected, and any fraction not under a half kanál will be treated as a whole kanál.

SPECIAL RULES.

9. If the land attached to a well which was assessed at a lump sum be lost by diluvion, a part in whole rupees of the well assessment will be remitted in propor-

tion to the area of well land which has been lost, and the distribution of assessment of the well may be modified. If the well itself be lost, the whole assessment upon it will be remitted.

10. Land taken up for inundation canal works within any part of a village affected by these rules will be treated as if rendered unculturable by river action.

11. The same will apply when, owing to the village homestead having been washed away, cultivated land has to be taken up for a new homestead.

PROCEDURE.

12. In case of diluvion or *khalmar* the Patwári will chain the remaining part of fields which have been partly washed away, and will plot the position of the river bank on the girdáwari map by a red line, and will write at both ends of the line the word *burdi* and the English year. He will then take out the area of the remaining parts of these fields and will fill up khasra, Form B. *Khalmar* will be treated as diluvion except in Form D, where it will appear only as change of class.

13. (a) In case of alluvion, if the area gained is included in the girdáwari maps the Patwári will plot a line thereon as in the case of diluvion, writing at both ends the word *barámad* and the English year. He will then fill up the khasra, Form J.

(b) If the land gained is not included in the girdáwari map, but was included in the settlement map or in any subsequent map, and if by the custom of the village the former boundaries of properties are to be restored, the Patwári, after plotting the line of the river by prolonging the squares up to the deep stream (or up to the boundary of the village, if the deep stream is not the boundary), will trace the fields from the proper map on to his girdawári map and proceed as above.

(c) If the land gained has not before been included in the village, or if it be not the custom to restore the former boundaries of properties, the Patwári will map the new land by extending the squares as above, and will divide the new land into numbers corresponding with the limits of the squares. New maps will be plotted upon regular mapping sheets, and the index map will be enlarged so as to include the new sheets.

14. Whether the field numbers are according to squares or according to former boundaries of properties, sub-numbers will not be made for plots of new cultivation nor the temporary cultivating holdings. The premature record of cultivators' sub-numbers should be avoided, for such divisions are often afterwards obliterated and recast, and their introduction into the map and annual papers will complicate all future business.

15. If part of the number was cultivated in the previous year, but the limits of the previous cultivation cannot be distinguished, the whole area under cultivation within the survey number may be measured anew and the previously cultivated area may be deducted.

16. Tracing will be filed of the fields lost and gained by diluvion and alluvion and of the newly-cultivated fields, the limits of new cultivation being shown on the tracing by rod-dotted lines and by writing the word *nautor* within the spaces newly cultivated.

17. No map is required for change of class other than new cultivation ; the entries in form Z will be sufficient. When a crop is very poor, the word *nákis* will be written after the area of the crop in form Z or in form J, as the case may be. The entries in form Z will also be sufficient record for any land which has fallen out of cultivation. Grazing lands will be entered in form Z, and no other record of them is required.

18. Form Z will be preserved continuously in a bound volume for the whole period of settlement. A copy will be filed every year of those numbers only of which the assessment is changed.

19. When the alluvial land extends to a considerable distance from the village base marks, supplementary base marks should be made in convenient positions near the river. These may consist of large posts deeply planted in the ground and surrounded by a ditch ; they should be so permanent and conspicuous that when seen they cannot possibly be mistaken.

20. When the measurements are to be inspected by an officer, the Patwári should plant flags at all the corners and in the centre of each of the squares in which measurements have been made.

21. In making out the girdáwari khasra, the word *kámil* will be written in the margin against the number of every field charged with the full inundated rate ; and when any other field becomes assessed at the full rate, the word *kámil* will be written against it in the column for changes for the year in question.

22. The whole diluvion file should be prepared on Lucknow paper, stitched at the back in book form. The tracings of maps will be on sheets not exceeding the size of a regular mapping sheet, and they will be placed in an envelope the full size of the file and will not be folded more than twice.

FORM A.—*The Map.*
B.—*Diluvion Khasra.*

Serial No.	No. of holding.	Khaara. No.	Tarf or Patti.	Owner.	Tenant.	Former area—Katala*	LAND REMAINING.			LAND LOST.			REMARKS.
							Length.	Breadth.	Area.	Area.	Soil (Kiem zamin).	Revenue class (Kisan parts).	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

NOTE.—(1) *Khalnar* areas will be noted as such in the remarks column.
(2) Total column 11, and under the total show details of soil and class.

FORM J.—*Khasra of Alluvion and new Cultivation (Barumadwa Nautor).*

Serial No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
No. of holding.	Khasra No.	Tarf or Patti.	Tenant.	Owner.	Length.	Breadth.	Dimensions.	Area.	Former.	Present.	Soil.	Khurif.	Crop.	Rabi.	Revenue class.	REMARKS.

NOTE.—Total columns 10 and 12, and give details of soil and class.

FORM D.—Abstract Statement of Changes (Milán Rakba Burd Barámad) ascertained at end of Kharís, Sambat 19 -19 (A. D. 18 -18).

NOTE.—(1). In the totals of columns 7—10 enter revenue of each class under the areas, and in column 11
part totals of both area and revenue.

NOTE.—(2). If the village is entirely under the dialuvion rules, columns 5 and 6 will be blank. If not, then at the foot of column 11 add the totals of columns 5 and 6.

FORM H.—*Alluvion and Diluvion (Burd Barāmad) Khewat, prepared at end of Kharif,
Sambat 19 -19 (A.D. 18 -18).*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				FORMER.			PRESENT.			DIFFERENCE.				
				Khāsra No.	Area.	Rate.	Revenue.	Area.	Rate.	Revenue.	Increase.	Decrease.	Amount of revenue for each holding for new year.	REMARKS.

NOTE.—This Statement will be in the same detail as is usual in the revenue columns of the Jamabandi.



FORM Z.—Register of Fields assessed below full rates.

E. B. FRANCIS,

Settlement Officer.

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Scale 1 Inch = 8 Miles.

Scale 1 Inch = 8 Miles.

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Boundary of tract under Settlement	—
Uttar Danda or old river bank	—
Upper Rohi or Moga plain	—
Lower Rohi or Mudki plain	—
Be...—	—
Mahraq Circle	—

